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DESIGN AND IMPLEMENTATION OF A DATABASE MANAGEMENT SYSTEM TO SUPPORT ADMINISTRATIVE ACTIVITIES ONBOARD HELLENIC NAVY VESSELS

by

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The Hellenic Navy ships have a challenging mission which encompasses tactical, operational and administrative tasks. This mission is carried out by the personnel serving onboard. In order to more effectively manage the personnel, an automated database management system is required. This system would contain all personnel records and other pertinent information. Furthermore, the system would produce periodic reports required by other commands concerning crewmembers, as well as a variety of other reports designed by the user to support the daily activities onboard.

This thesis designs and implements an automated database system that can be used on the Hellenic navy ships. The methodology followed is the standard systems' development life cycle (SDLC). The requirements for the system are obtained, and the database and application are designed and implemented. Paradox is used for the database management system software. Special issues like training, security, conversion and maintenance are taken into consideration.

The result of this thesis is a functional application named "SPAS" (Shipboard Personnel Administration System) that will fulfill the users' requirements, keep track of the administrative activities of the ships, and help in performing the desired tasks accurately.

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I. INTRODUCTION

A. OBJECTIVE

This thesis designs and implements a database system for the Hellenic Navy ships. The purpose of the system is to support all the administrative activities of the personnel assigned onboard. The implementation of the database system would greatly reduce the work hours spent on specific administrative tasks that are instrumental in accomplishing Hellenic Navy ships' principal tasks and maintaining an efficient operational level. The database design takes into consideration the Hellenic Navy ships' functional requirements. The primary function of the database system is to maintain the records of necessary personnel and other relevant information. From this database standard reports are generated, and ad hoc queries and reports are created.

B. BACKGROUND

In every battle ship the personnel should be organized in such a way that the ship can provide a variety of functions and operate under different situations in different environments. These functions are performed by the persons serving on the ship. The management of this personnel organization is a difficult and time-consuming job in terms of personnel data entry, maintenance of manually kept forms, determination and allocation of duties and handling personnel requests. Furthermore, the large volume of daily, weekly and monthly reports required either for submission to the higher command or for the ship's internal use, makes the personnel administration job very difficult. In addition, the command needs help in making decisions about subjects of an administrative nature: for example, having people process data in order to propose a suggestion is a time consuming task and might result in inaccurate and unreliable information.

The ship consists of departments which are managed by the department heads, and divisions which are managed by the division officers. In the Hellenic Navy, only commissioned and non-commissioned officers serve on a permanent basis while seamen serve for a short standard period of time. Crewmember changes are based on annual occurrences. Seamen changes are based on the time served. From time to time projection tables must be sent to the Navy training centers for future needs of seamen assignments. The new seamen must first obtain training for special duties; then they have to be qualified by the division officer or the department head; finally they may get some additional training while they serve.

To help the reader in what follows, the following are some brief explanations of terminology as applied in the Hellenic Navy:

Port Duty Station is the assigned position in which every crewmember has to work while in port.

Fitness Evaluation is a compulsory procedure for officers up to the rank of Lieutenant and Petty Officers up to 40 years old, in which they must pass an annual physical fitness test.

Promotion is a promotion in rank. Seamen do not receive promotions, only Officers and Petty Officers do. The promotion can never exceed the following higher rank.

Disciplinary report comprises the crewmember's offense, apology, and punishment. A record of the date, nature of event, facts and everything related to the offense is kept.

Crew division systems is how the crew is divided to perform onboard activities. There are two crew division systems. The first is called "Half Crew Division System" under which each crewmember is scheduled to work 6 hours and rest for 6 hours. The second work schedule is called "One Third Crew Division System" and has shifts of 4 hours on and 8 hours off. The decision to adopt either one of the systems depends on the type of ship's operations being conducted.

Leave designates the type of leave given to crewmembers. In addition, seamen serving onboard a ship have right to the so-called "sea duty leave".

On the Job Training Evaluation (OJT) applies to Officers, Petty Officers and seamen who are all subject to OJT Evaluation. The evaluation occurs at regular intervals and is set by the Department Head or the Division Officer. If a member changes his position, the OJT Evaluation is automatically performed.

Abandon Ship Station is the preassigned station in which every crewmember has to proceed once the order "Abandon Ship" has been given.

The *Armed Security Group* is composed of an Officer as the leader and several Petty Officers and sailors; it has the predefined task of defending the ship against terrorist attacks or intruders.

Change in Command is a change of role or duty in the Department or the Division for an Officer or a Petty Officer.

Mooring, Anchoring, and Towing station are the areas where all personnel are assigned to be while mooring, anchoring or towing is occurring.

Training is the term that covers the training received in a school by an Officer, Petty Officer or seaman.

Air controller is an Officer or Petty Officer whose duty is to control all aircraft cooperating with the ship.

Alert Station is the pre-assigned position of each crewmember under alert conditions.

Replenishment at Sea Station is the station to which a specially trained team, led by an officer, proceeds when refueling at sea. The task of the RAS team is to take the necessary actions until refueling is over.

XO's Daily Report Division is the division system in which crewmembers are gathered during the XO's daily morning report.

C. METHODOLOGY

There are different methodologies for developing systems. The process that will be followed in this thesis captures the essence of most development methodologies. The fundamental phases are:

- Definition phase:

  During the definition phase, the tasks are to form the working team, define the problem, establish the scope, and access feasibility issues.

- Requirements phase

  During the requirements phase, the tasks are to create the user's data model, determine the update, display, and control mechanisms, as well as the functional components of the application, interview the users, and use prototypes to help determine user requirements.

- Evaluation phase

  During the evaluation phase, the tasks are to select the system's architecture, and reassess feasibility issues.

- Design phase

  During the design phase, the tasks are to develop the database design and the application design. The database design consists of structuring the relations, and establishing the relationships among them. The application design, deals with the design of the menus, reports, and forms as well as to specify update, display, and control mechanisms.

- Implementation phase

  During the implementation phase, the tasks are to construct the database, build the application, and install it.

This System's Development Life Cycle was utilized in the development of the Shipboard Personnel Administration System (SPAS) of this thesis.

D. CHAPTER OUTLINE

The thesis is organized as follows:

Chapter II is a general description of the database development process. It reviews database concepts, and describes the database development phases. These phases, the requirements analysis and specification, the design, and the implementation, are detailed in the following chapters.

Chapter III is the requirements analysis of the system. The operating environment is studied by means of the user's descriptive list of requirements for the system's functionality, data manipulation and production of specific information. The requirements and accompanied entity-relationship data flow diagrams are provided. The chapter concludes with a description of the requirements specifications as they pertain to data, hardware and software issues.

Chapter IV describes the design process followed in developing the Shipboard Personnel Administration System (SPAS). The data and process models developed in the previous chapters are transformed into a relational and application design, respectively. The last section provides commentary about the data dictionary and its benefits to the database system design.

Chapter V is a discussion of the final phases involved in developing the database system. These phases are the implementation portion of the data and process design and they include programming and planning for the system's implementation.

Chapter VI deals with other important issues in developing the system such as testing, database security, personnel training, system conversion, maintenance and future upgrades.

Chapter VII is the concluding chapter. It provides a short summary of the thesis and addresses future enhancements to the system developed. Also included are lessons learned in developing the system.

Appendices A through I supplement the previously described text. The appendices are: Object Diagrams, Data Dictionary, Data Flow Diagrams, Relational Schema, Application Menus, Application Input Forms, Application Reports, System's Program and Code and Procedures for installing and operating SPAS, respectively.

II. DATABASE DEVELOPMENT PROCESS

In this chapter we will discuss basic database concepts as well as the database development methodology. Each step of the system's development methodology is described in some detail.

A. DATABASE CONCEPTS

The term *database* is subject to many different interpretations. It has been used to refer to everything from a collection of index cards to the volumes of data that a government collects about its citizens. In the following we will use this term with a specific meaning: *A database is a self-describing collection of integrated records.*

1. A Database is Self-Describing

In addition to the user's source data, a database contains a description of its own structure. This description is called the data dictionary, and makes program/data independence possible. In that way, by examining the database itself, it's easy to determine its structure and its components; no external documentation of file and record formats is needed. Furthermore, when changing data in the database, we only need to make corresponding changes to the data dictionary.

2. A Database is a Collection of Integrated Records

As shown in figure 1, a database is more than a collection of files. It includes source data, a description of the database structure (data dictionary), and a description of the relationships among the records of the files (overhead data). The main difference between a database and a file processing system is that a database is able to store these relationships.

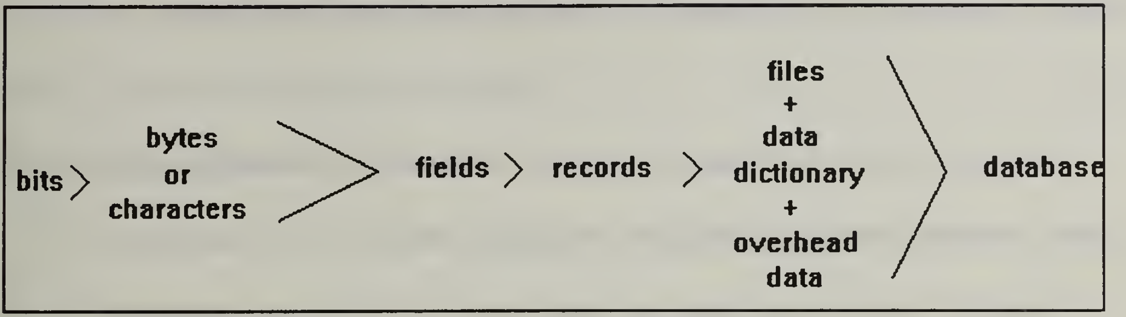

bits
bytes or characters
fields
records
files + data dictionary + overhead data
database

Figure 1: Hierarchy of data elements in database processing

3. Components of a Database Processing System

A database processing system has five components as shown in figure 2.

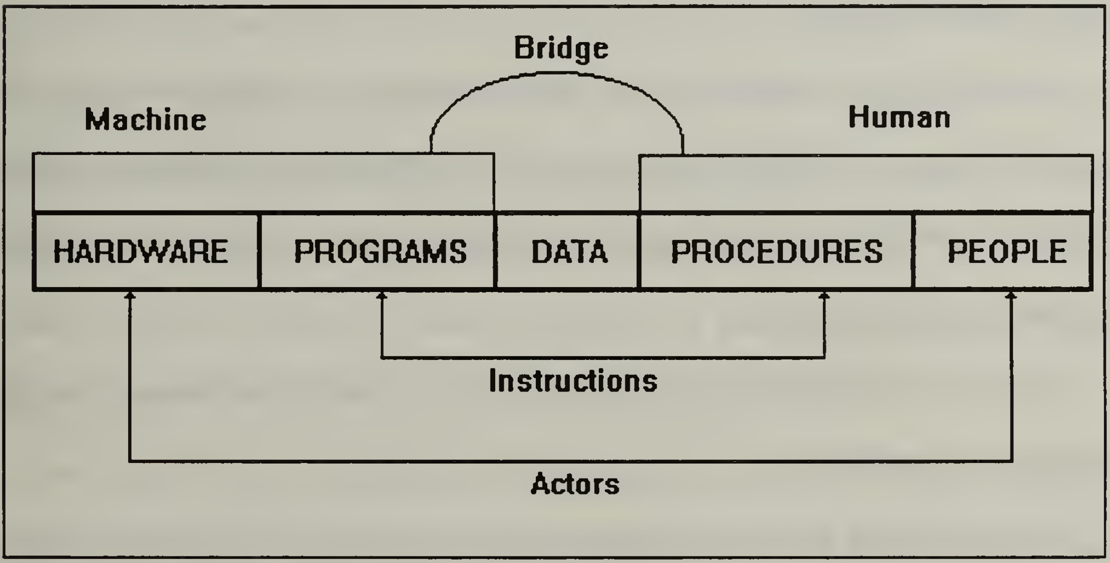

Bridge
Machine
Human
HARDWARE
PROGRAMS
DATA
PROCEDURES
PEOPLE
Instructions
Actors

Figure 2: Components of a database processing system

These are hardware, programs, data, procedures and people. The most important components are the people and the data. The data contain all the useful information that people need to perform their tasks and complete their activities.

B. DATABASE DEVELOPMENT METHODOLOGY

The database development methodology described here consists of four phases: definition, requirements, evaluation, and design. Each phase consists of a number of tasks.

During the definition phase the tasks are to form the working team, define the problem, establish the scope, and access feasibility issues.

During the requirements phase, the tasks are to create the user's data model, as well as the functional components of the application. This is accomplished by interviewing the users, and using prototypes to help determine user requirements.

During the evaluation phase, the tasks are to select the system's architecture, and reassess feasibility issues.

During the design phase, the tasks are to develop the database design and the application design. The database design consists of structuring the relations, and the establishing relationships among them. The application design, deals with the design of the menus, reports, and forms.

During the implementation phase, the tasks are to construct the database, build the application, and install it.

The requirements, design, and implementation are detailed in the following sections.

C. REQUIREMENTS ANALYSIS / SPECIFICATIONS

Accurately obtaining the system's information requirements from the potential users is essential. No system can be designed without first understanding the current process intended for improvement. After the system's definition and primary analysis phase, where the general goals of the system are determined, the requirements phase follows. The purpose of this phase is to determine, as specifically as possible, what the system must do. There are two tasks in this phase:

- develop a user's data model
- determine the functional components of each application that will use the database

1. Data Requirements

During the data requirements phase, the major goals are to build a data model that documents the "things" that are to be represented in the database, to determine the characteristics of those "things" that need to be stored and to determine the relationships among them. The user's data model describes the objects that must be stored in the database, along with their structure and the relationships that they have with one another. The output of the data requirements phase is a statement of requirements. This statement can take a variety of forms: a verbal description; an entity-relationship and objects diagrams; one or more prototypes; or any combination of the above.

The "things" that are represented in the database are referred to as either entities or semantic objects (in some cases just objects) depending on the modeling technique that the designer follows. In this thesis the semantic object model will be followed.

A semantic object is a named collection of properties that sufficiently describes a distinct identity. Semantic object diagrams assist in the system analysis as well as the design phase. Some of the characteristics of semantic objects are:

- the semantic objects are grouped into classes; each class has a distinctive name; classes are shown in capital letters
- an object is a collection of properties with a sufficient description
- objects represent distinct identities
- the identities that the objects represent may or may not have physical existence

Objects have properties that define their characteristics. These properties can be simple property, composite of a group of properties, or another object. An object can have single or multiple values. In a semantic object diagram, objects are shown in boxes; their name appears beneath or above the rectangle and properties are written inside the rectangle. The "MV" symbol next to a property declares that this property can have multiple values. The non-object properties have scalar values while the object properties are separate objects by themselves. Figure 3 shows a sample object.

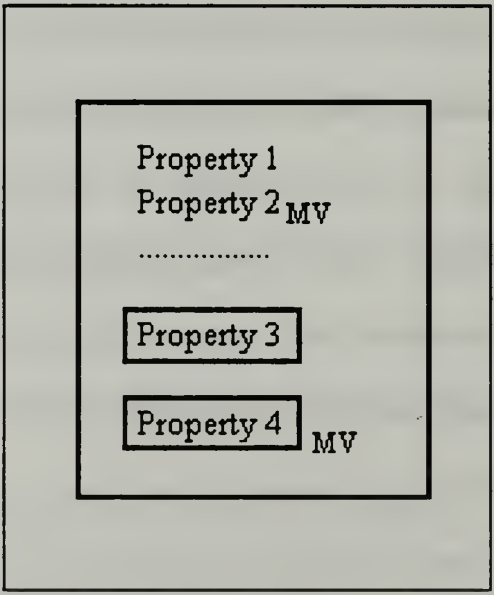


Figure 3: Sample Object

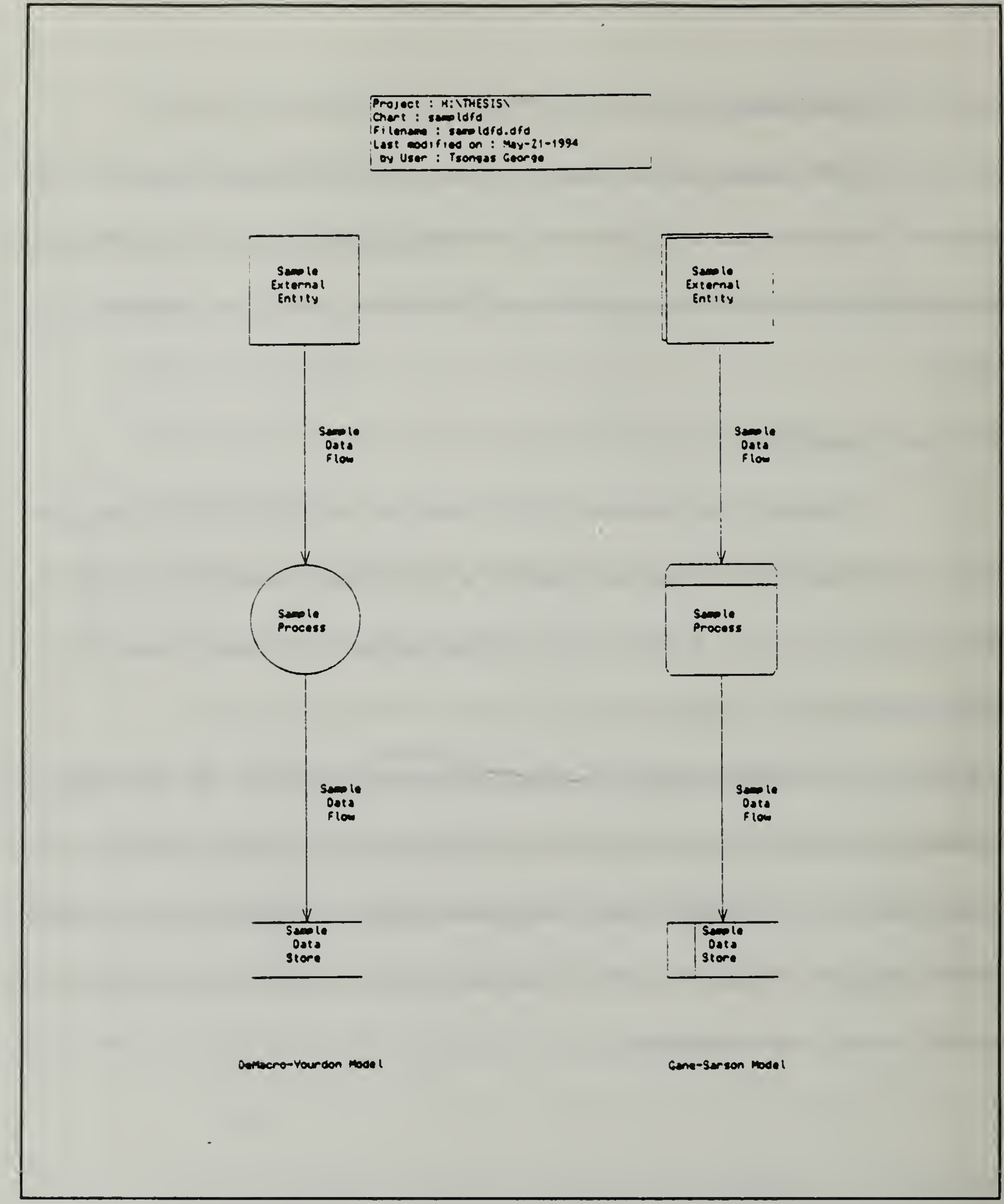

Project : H:\THESIS\
Chart : sampldfd
Filename : sampldfd.dfd
Last modified on : May-21-1994
by User : Tsongas George
Sample External Entity
Sample Data Flow
Sample Process
Sample Data Flow
Sample Data Store
Sample External Entity
Sample Data Flow
Sample Process
Sample Data Flow
Sample Data Store
DeMacro-Yourdon Model
Gane-Sarson Model

Figure 4: DFD Models

e. Leveling of DFDs

When studying, analyzing and designing a system, it is good to have a generic pictorial outline of what the system does or will do when it is implemented. This pictorial outline which is called "Decomposition Diagram", also called "hierarchy chart", shows the top-down functional decomposition or structure of a system. Decomposition diagrams also provide an outline for drawing the DFDs. Only the processes are presented on decomposition diagrams and they are connected to form a treelike structure. Process names conform with the ones that are referred to in the DFDs. The top process is called the root; it is exploded or factored out to subsystems, functions or tasks. It defines the scope and boundary of the system to be developed.

D. DATABASE DESIGN

The goal of the design phase is to develop a blueprint of all five components, shown in figure 2, of the information system. For the data component, the structure of the database is developed. To accomplish that, the development team translates the user data model into specific data structures. For the process component, the process model is transformed into an application design.

1. Logical Database Design

After the semantic objects are developed, the next step is to transform these objects into a relational design. The resulting relations are then normalized. This is a very important part of the design because we need to be sure that the objects' relations will not suffer from any update anomalies. The process of normalization is discussed in the following section.

a. Normalization

Normalization is the process of forming well-designed relations by grouping attributes together. This process examines the relations to test if they are in one of the predefined normal forms. The normalization process ensures data is stored in a manner that minimizes data redundancy and update anomalies while maintaining data integrity. The normal forms are shown in figure 5.

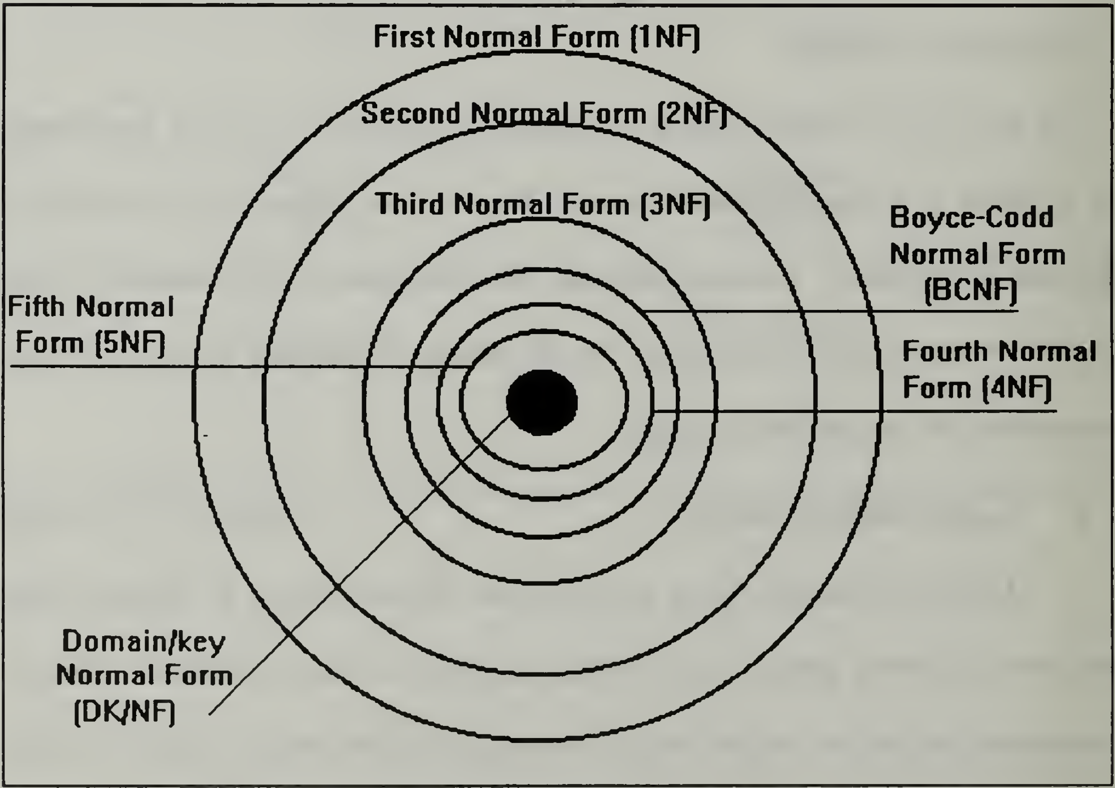

First Normal Form (1NF)
Second Normal Form (2NF)
Third Normal Form (3NF)
Boyce-Codd Normal Form (BCNF)
Fifth Normal Form (5NF)
Fourth Normal Form (4NF)
Domain/key Normal Form (DK/NF)

Figure 5: Normal Forms and their Relationship

As indicated in figure 5, each of the higher normal forms contains the lower ones. This means, for example, that a relation that is in the third normal form is also in both first and second normal forms. Therefore the steps in the normalization process are progressive and one normal form follows another. In each step only certain anomalies are eliminated. It is mandatory for relational database designers to satisfy the requirements of all the normal forms to ensure that all anomalies have been eliminated.

(1) First Normal Form (1NF)

A relation is in the first normal form if it has no repeating groups. That means that all the attributes in the relation are atomic. Since this is the definition of the relation, we can safely say that every normalized relation is in the first normal form.

(2) Second Normal Form (2NF)

A relation is in the second normal form if it is in first normal form and all non-key attributes are dependent on all the attributes of the key. If the key is a single attribute then the relation is automatically in the second normal form. If the key is a set of attributes then all the non-key attributes must be fully functionally dependent on that key.

(3) Third Normal Form (3NF)

A relation is in the third normal form if it is in second normal form and it has no transitive dependencies. A transitive dependency occur if A→B, B→C, then A→C.

(4) Boyce-Codd Normal Form (BCNF)

A relation is in Boyce-Codd normal form if it is in third normal form and every determinant is a candidate key; any attribute that functionally determines any other attribute is a candidate key.

(5) Fourth Normal Form (4NF)

A relation is in the fourth normal form if it is in Boyce-Codd normal form and the multivalued dependencies are eliminated. This case exists when there are more than two attributes in a relation, two of them are multivalued, and their values depend only on a third attribute.

(6) Fifth Normal Form (5NF)

A relation is in the fifth normal form if it is in forth normal form and does not have a joint dependency.

(7) Domain / Key Normal Form (DK/NF)

A relation is in Domain/Key normal form if every constraint of the relation is a logical consequence of the definition of *keys* and *domains*. A domain is a description of the allowed values of an attribute. Fourth, fifth and the domain/key normal forms have little practical usefulness and are usually ignored in practice.

2. Application Design

The design phase includes the design of both the database and the application. An application is the collection of menus, forms, reports, and programs that provide a means of update, display, and control the objects of the data model. During the application design, the specific structure of forms, reports, menus, and query facilities are defined. Also, the logic of transaction programs that will be written for the system is developed. The application design will be discussed further in chapter IV.

E. DATABASE IMPLEMENTATION

The system's implementation is the set of activities following the logical design, and consists of the production of a working system that accepts input from the user, processes data and produces the desired outputs. One very important task during the development of a software application is the development of the user's manual.

F. OTHER CONSIDERATIONS

Important issues such as testing, security, training, conversion, maintenance, and future upgrades will be considered and discussed later in chapter VI.

Testing has been defined as "the fiendish and relentless process of executing all or part of a system with the intent of causing it to exhibit a defect" (Page-Jones, 1988, p. 358). The testing phase has traditionally involved first the testing of separate parts of the system and then the testing of the system as a whole. The whole system is then turned over for acceptance testing (quality assurance). Acceptance testing is carried out by the user, the user's representatives, the analysts, the standards group, external system auditors, or any combination thereof. Structured techniques emphasize the interweaving of the testing phase as much as possible with the implementation phase so that the system quality is "built in" rather than "added in" after the fact. The development of test cases and a test plan can begin at the end of analysis and be carried out during the design phase itself. This will ensure that testing is ready to begin as soon as the implementation phase commences.

1. Testing Techniques

All testing involves the following six steps:

a. *Select what is to be measured by the test.* The goal of the test must be determined. Are the requirements to be tested for completeness? Is the code being tested for reliability? Is the design being tested for cohesion?

b. *Decide how whatever is being tested is to be tested.* A decision of how to test for quality must be made. A wide variety of approaches are available, including inspection, proofs, black box and white box testing, and automated methods. The tester must decide what kind of test is to be used to measure the desired quality.

c. *Develop the test cases.* Once the actual test has been decided the actual test cases must be created. A test case is simply a set of data or situations that will be used to exercise the unit being tested.

d. *Determine the correct or expected results from the test and create the test oracle.* It is very important for the tester to know what the correct result should look like, and determine the "test oracle" which is the predicted results for a set of test cases.

e. *Execute the test cases.* In this step the tester has to carry out all the tests.

f. *Compare the results of the tests to the test oracle.* A very careful comparison between the actual results of the test and the test oracle should be done in this step. Any discrepancy between the predicted results and the actual results signals an error. The source of the error must be tracked down. In most cases the error is in the system that is being tested. However, in some cases, the error may be in the testing process or in the test oracle.

In order to understand the testing techniques more clearly let's take the sample system of figure 6, and see in what ways this system can be tested. Figure 6 shows a sample modular hierarchy of a hypothetical system. Modules A,B,C,D,E,F and G represent parts of the developed units/code to be tested.

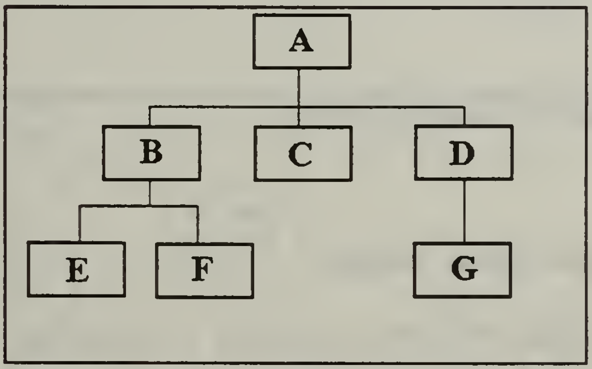


Figure 6: Sample Modular Hierarchy

a. Traditional Approach to Testing

Figure 7 shows the traditional testing technique which requires testing every module after its completion phase, integrating the whole system, and testing the complete system at once. Following the traditional testing technique the tester may experience difficulties at the integration point where he has to test the complete system and where most of the problems are surfaced.

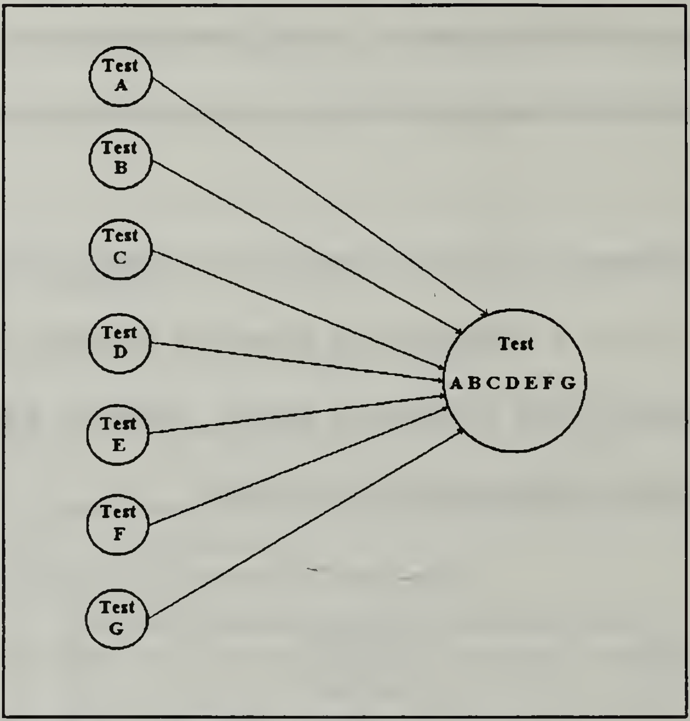


Figure 7:Traditional Testing

b. Top-down Testing Strategy

In this case the testing procedure is driven by the system modular hierarchy and follows the top down design. Figure 8 shows the top-down testing strategy which is characterized by relatively early integration, no need for module drivers (modules that are not fully implemented), low work parallelism at the beginning, and difficulty in testing particular paths, and planning and controlling the sequence of tests.

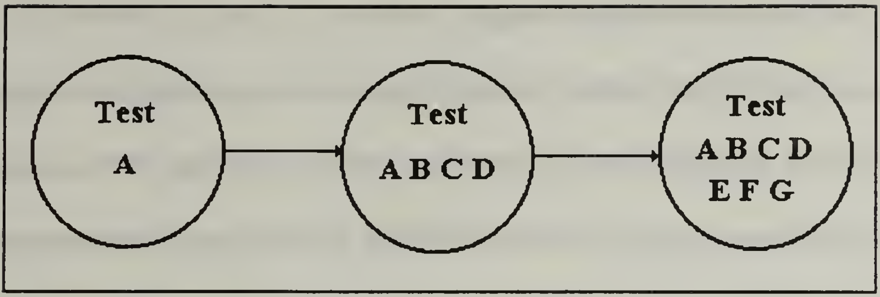

Test
A
Test
A B C D
Test
A B C D
E F G

Figure 8:Top-down Testing

c. *Bottom-up Testing Strategy*

Figure 9 shows the bottom-up testing strategy in which every individual module is tested starting from the bottom and working backwards to the top. This technique is characterized by late integration, need for module drivers, medium work parallelism at the beginning, ability to test particular paths easily, and difficulty to plan and control the sequence of tests.

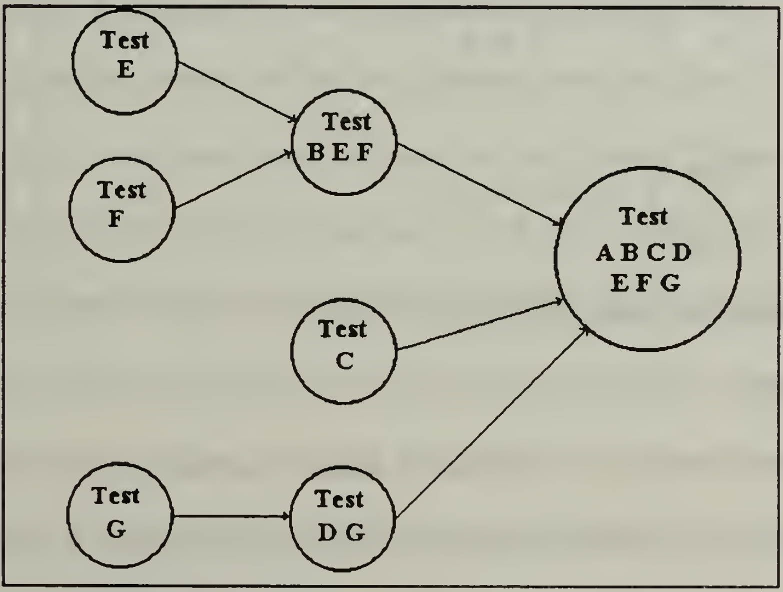

Test
E
Test
F
Test
B E F
Test
A B C D
E F G
Test
C
Test
G
Test
D G

Figure 9: Bottom-up Testing

d. Sandwich Testing Strategy

Figure 10 shows the sandwich testing strategy which is a combination of both top-down and bottom-up testing strategies, and ensures that all the modules have been implemented as soon as the "Test A, B, C, D, E, F, G" modules have been tested. This technique is characterized by early integration, medium work parallelism at the beginning, medium ability to test particular paths, and difficulty to plan and control the sequence of tests.

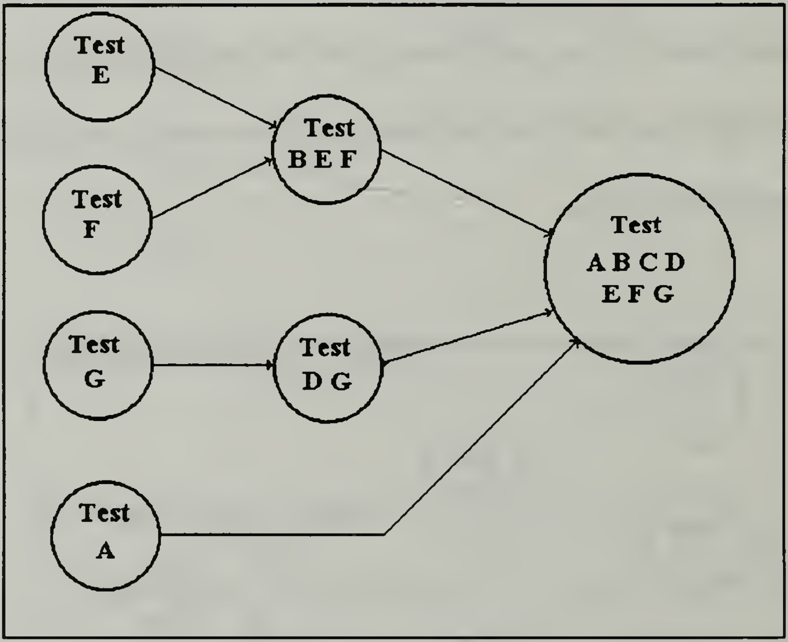


Figure 10: Sandwich testing

2. Security

Database security is important because databases are so critical to an organization. Even with an efficient operating system, data is at risk if a reliable database system is not used. Operating systems usually protect data at the file level. Databases however need protection at different levels such as table or relation, row or tuple, or even element. In addition, different discretionary security policies are often desired for database systems that restrict access to specific data through specific operations, such as insert, update, retrieve and delete. Such controls are not available in operating systems.

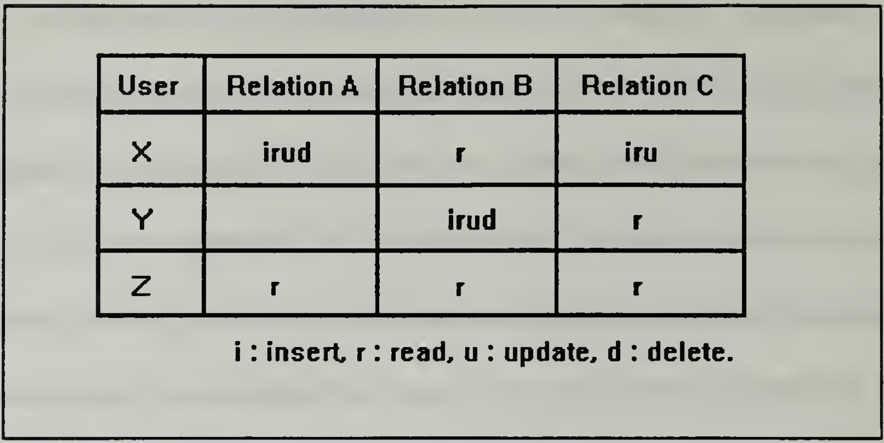
There are seven conceptual requirements for database security. These are authentication, access control, availability, physical integrity, logical integrity, element integrity and audit trail. There is a certain amount of dependence between these seven aspects, since a failure in one area may expose the database to increased vulnerability from the remaining areas.

Authentication is the requirement to positively identify every user of the database. This may be achieved through the use of information known only to a particular user, (e.g. password), the use of some physical item, (e.g. a key or pass card), or reference to some physical aspect of the user (e.g. fingerprints, voice pattern).

Access control defines the *who* and the *what* of allowed activities on the system's data. The *who* describes which subjects have access to which objects. The *what* defines the operations (e.g. read, write, etc.), allowed on each object. Figure 11 shows an example of an access control list for three users and three relations. This sample access control list permits user "X" to access relation "A" to insert, read, update and delete data.

Availability means that authorized users should not experience denial of service.

Physical security involves protecting the media which stores the database from damage. This may include measures to protect the physical media from natural disasters, fire, and accidental or intentional abuse.



User	Relation A	Relation B	Relation C
X	irud	r	iru
Y		irud	r
Z	r	r	r

i : insert, r : read, u : update, d : delete.

Figure 11: Access Control List Example

Logical integrity involves protecting information about the logical structure (schema) of the database, which in many occasions is stored separately from the base data. *Element integrity* is concerned with the accuracy and correctness of the data in each data element.

Audit trails answer the *who*, *what* and *when* about access to data in the database. It is a permanent record of who has accessed what elements of the database, what actions were performed upon them, and when the action took place.

3. Conversion

The conversion phase is probably the most important phase of the system implementation from a managerial perspective. This is the time that users and system development personnel have to work closely together. Human nature is to resist any kind of changes, especially if they are not ready or prepared for that change. Factors such as organizational structure, human resources, and political and cultural climate all come into play. Management sometimes has to restructure the organization chart when a computerized system is implemented into the organization environment. Human resources are often reallocated to and from the new system so the principle of "the right man in the right position" will be guaranteed. Conflicts among users and workers who don't believe in automation should be expected. Furthermore, some employees view training programs as a threat because they believe that evaluations made at the end of the training will be used against them.

a. Strategies

There are four strategies that can be used to implement a system. They are: Parallel Conversion, Direct Conversion, Phased Conversion, and Pilot Conversion.

(1) Parallel Conversion

Figure 12 shows the parallel conversion technique which is widely used. It consists of operating both the old and the new system at the same time, until management is satisfied that the new system is working efficiently. At this point the old system is discontinued. This technique eliminates the risk involved with implementing a new system, but requires a lot of manpower to maintain both systems in operation.

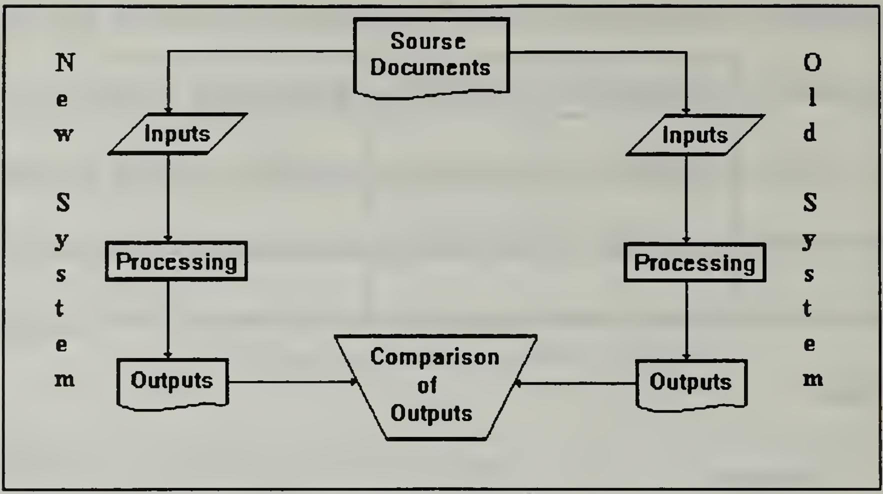

New System
Sourse Documents
Old System
Inputs
Inputs
Processing
Processing
Outputs
Comparison of Outputs
Outputs

Figure 12: Parallel Conversion

(2) Direct Conversion

Figure 13 shows the direct conversion which is characterized by shutting down the old system at the end of one workday and starting up the new system the next workday. This technique can be extremely risky, but it is gaining in popularity over the parallel conversion strategy for the following reasons:

- By using the parallel approach, the need for manpower is greater. Furthermore, by continuing with the old system, it may cause some users not to make a genuine effort to support the new system
- With thorough testing of the system and training of the personnel, the new system should operate at acceptable levels
- In many cases the risk of failure of the new system may be acceptable

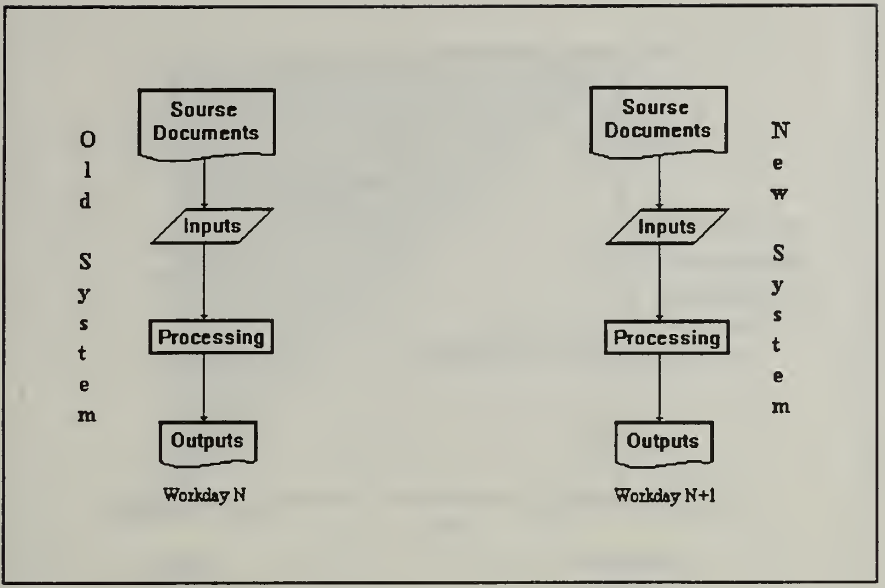

O
l
d
S
y
s
t
e
m
Sourse Documents
Inputs
Processing
Outputs
Workday N
Sourse Documents
Inputs
Processing
Outputs
Workday N+1
N
e
w
S
y
s
t
e
m

Figure 13: Direct Conversion

(3) Phased Conversion

Figure 14 shows the phased conversion technique through which the old system is phased out and the new system is gradually phased in. This approach has many of the same problems that parallel conversion has, primarily because both systems operate simultaneously. Furthermore, the outputs of the two systems have to be combined to obtain a total picture. Finally, by shifting to the new system, no backup of the old one exists, and if the new system fails then the only way to retrieve lost information is by reverting completely to the old system. The big advantage is that the shift from the old system to the new one is quite smooth. As the user gradually becomes familiar with the new system while continuously using it, he starts seeing the advantages of the new system. This is a key factor in minimizing user resistance.

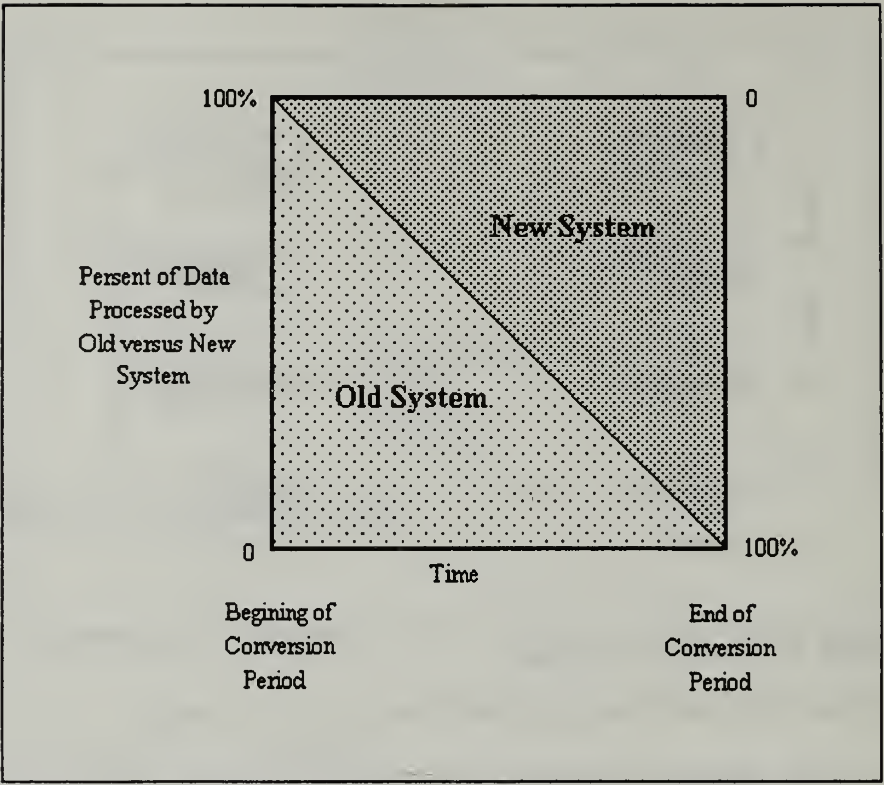

100%
0
New System
Old System
Persent of Data Processed by Old versus New System
0
100%
Time
Begining of Conversion Period
End of Conversion Period

Figure 14: Phased Conversion

(4) Pilot Conversion

Figure 15 shows the pilot conversion technique. Pilot conversion consists of implementing the new system in a selected portion of its ultimate site. If the system operates efficiently on this selected portion, it is then fully implemented at the entire site. Within the pilot area, the system can be implemented in any of the previously discussed methods. The pilot approach avoids many of the problems that the other alternatives have. One drawback however, is that it does not test whether the system will operate satisfactorily under the increased volume of full implementation.

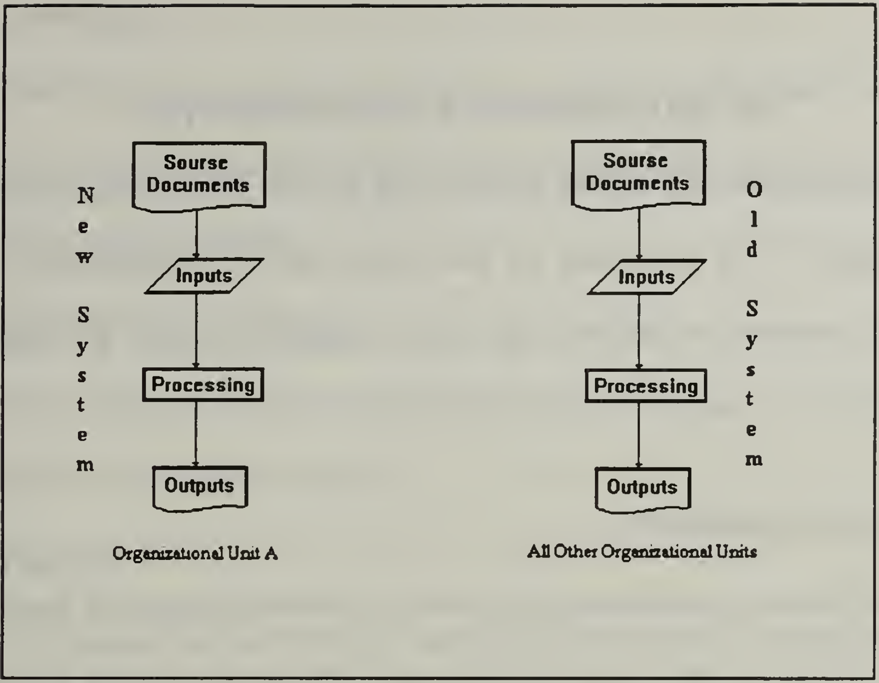

N e w S y s t e m
Sourse Documents
Inputs
Processing
Outputs
Organizational Unit A
Sourse Documents
Inputs
Processing
Outputs
O l d S y s t e m
All Other Organizational Units

Figure 15: Pilot Conversion

III. REQUIREMENTS ANALYSIS FOR SPAS

In this chapter we will discuss both the data and the process requirements for the SPAS application. We will create the data model and the corresponding data flow diagrams that represent the data flow that create, update and display the objects of the data model.

A. DATA REQUIREMENTS

Data requirements are captured in the form of semantic objects and associated data dictionary. This application consists of seventeen (17) semantic objects that are shown in Appendix A. In this diagram objects and object properties are indicated in upper case, attributes in mixed case, and identifiers are underlined.

1. SHIP

A ship has a *name*, belongs to a *class*, is commanded by a *Commanding Officer*, helped by an *Executive Officer* and belongs to a *higher command*. The ship internally is organized into *DEPARTMENTs*.

2. DEPARTMENT

A department has a *name*, is controlled by the *department head* who is an officer, and has an *office* and a *phone number*. It belongs to the *SHIP* and contains and controls one or more *DIVISIONs*.

3. DIVISION

Similar to a department, a division has a *name*, is controlled by the *division officer*, and has an *office* and *phone number*. Every division has one or more *PERSONs* and belongs to a *DEPARTMENT*.

4. PORT DUTY STATION

A port duty station that the *PERSON* could be assigned to while in port has a *name*, a *location* and a *phone number*.

5. PERSON

The persons onboard the ship work for a *DIVISION*. Every person has a unique *identification number*, a *first* and *last name*, a military *rank* and *rate*, owns a *current position* after being reassigned from his *previous* one on a *certain date*, has a *specialty*, and should belong to three different division systems in order to be able to complete his individual tasks depending on the general ship's situation. These systems are the *one third crew division system* that applies when the ship is underway with three watch shifts, the *one half* that applies when the ship is on two shifts and a *session* division system that applies every morning while in port for the XO's daily report. Every person has a *date of birth*, an *address*, has to provide his *nearest police station address and phone number* in case of emergency, has a *religion, hobbies*, background *education* and may speak one or more *foreign languages*. As soon as he embarks he is assigned a *berthing place*, some *SPECIAL DUTIES*, a *PORT DUTY STATION*, an *ABANDON SHIP STATION* in case of an abandon drill or a real situation and one or more *SPECIAL*

STATION when the ship is mooring, anchoring towing or being towed. At any time, a person has the right to take *LEAVE* or to ask for a *SPECIAL REQUEST*. The command is also interested in other personal data, like the person's *DEPENDENTs*, his *FITNESS* condition, his *PROMOTIONs* and some work experience data, such as being qualified as an air controller and his current *qualification category*. Any time he performs *AIR CONTROL CHECKs* it is recorded and the ship is required to report it every month. Furthermore, all personnel are subject to periodic *ON THE JOB TRAINING EVALUATIONs*. Finally, a person undertakes *TRAINING* and is subject to *DISCIPLINARY* actions.

6. SPECIAL STATION

A special station that the *PERSON* could be assigned to has a *type* and a *title*. The person has a *duty* and has to carry some *equipment* and there is a *location* where all the persons have to be gathered.

7. SPECIAL DUTY

Similar to the station, a special duty that the *PERSON* could be assigned to has a *type*, a *title* and each person has some *instructions*. They have to carry some equipment and/or some *armament* depending on the mission and there is a *location* where they have to be gathered.

8. DEPENDENT

The crewmember's (*PERSON*)dependent has a *name*, lives at an *address*, and has a *phone number*. There is a possibility that the crewmember has other dependents.

9. DISCIPLINARY

Any *PERSON* onboard could commit an " illegal " action and be disciplined. That offense reported by an *officer*, has a *number*, a *name* and a *date* when it was committed. The person has the right to give his *apology*, while the command has to decide his *punishment*, the *date* that punishment *starts*, and the *date* that it *ends*.

10. PROMOTION

Normally, after a certain period of time the *PERSONs* onboard, commissioned officers and petty officers get promoted. The command needs to know the *promotion date*, the *command issued the order* for the promotion and the *date of the issued order.*

11. FITNESS EVALUATION

Once a year, all *PERSONs* have to be evaluated for their fitness condition. The fitness evaluation has a *reference period*, a *start date*, an *end date*, a pass or fail evaluation *grade* and any possible *comments*.

12. ON THE JOB TRAINING (OJT) EVALUATION

PERSONs periodically are evaluated on their job in order to be qualified or to refresh their technical skills and knowledge. The OJT evaluation is performed by the person's *department head*, has a *start date*, an *end date*, the resulting *grade*, any possible *comments* and the *station* that the person is qualified for.

13. TRAINING

The training of crewmembers is a continual activity. There are required schools that crewmembers have to attend in order to get promoted and there are schools whose attendance is on a volunteer basis. The ship's command needs to know what *school* each of the *PERSONs* have attended, the *date*, the *degree* or the *diploma*, the *grade* that the person obtained, his *order of success* among the other participants and any possible *comments*.

14. AIR CONTROL CHECK

PERSONs that are qualified as air controllers and are capable of performing tactical control on fixed wings or helicopters have to record each control check they perform, and the ship's command has to submit a consolidated report every month to the Tactical Training Center. The air control check has a *date* and a *time* that the control was performed, the *type of the aircraft*, the *type of the control* and its *duration* and possible *comments*.

15. LEAVE

By law, each person is entitled to 30 days normal leave every year. However, depending on the situation and the CO's decision, he could get additional days off. This special leave could be for personal/private reasons or for educational purposes. For example, special leave could be granted while the person is studying at a university and has to take exams, or, it could be given as a reward. The *PERSON's* leave is described by its *type*, has a *date starts*, a *date ends*, the *number of days* in leave, *destination*, as well as any possible *comments*.

A crewmember serving onboard the ship can submit requests, mostly concerning administrative issues. He can ask to report something personal to the CO or the XO, or ask to be heard by the higher commander or even by the Admiral of the Fleet. *PERSON's* request has to be recorded and has a *date*, a *type*, a *description*, the *CO's decision* and any possible *comments*.

17. ABANDON SHIP STATION

On the " ABANDON SHIP " order, everyone has to be at his abandon ship station. This is any of the life rescue facilities of the ship either a rescue boat or a floating raft. The abandon ship station has a *number*, a *location*, a *type* and a *capacity*. All of the *PERSONs* are assigned to an abandon ship station.

B. DATA DICTIONARY

The SPAS application data dictionary is shown in Appendix B. It describes each object, its properties, the data type, width, and definition of each property.

C. PROCESS REQUIREMENTS

In this application, the decomposition diagram and the data flow diagrams that describe the system's functionality are shown in Appendix C. The system has four levels. The zero level is the overall system picture named *Shipboard Personnel Administration System (SPAS)*. It is factored into three different subsystems titled *Personnel Subsystem*, *Request Subsystem* and *Report and Query Subsystem*.

a. *Personnel Subsystem*

This subsystem has five processes: *process crewmember data, process dependent data, process disciplinary data, process evaluation data and maintain person data.* The *process evaluation data* consists of two subprocesses: *on the job training evaluation data* and *fitness evaluation data.* The *maintain person data* process consists of five subprocesses to update the air control, crewmember, dependent, disciplinary and evaluation data. All these subprocesses have add, modify and delete mechanisms. Of special interest is the *process crewmember data* process through which all of a person's data is entered into the system as well as his assignment to special duties and special stations.

b. *Request Subsystem*

The request subsystem has only two processes to *process* any kind of *special request* or *leave request.*

c. *Report and Query Subsystem*

This subsystem produces predefined reports either for internal or external use. The *answer specified queries* process is considered a utility for the production of internal reports to support the ship's command with any kind of information relative to a person. The *produce internal reports* process is split into the following subprocesses: *produce person's information card, produce person's information book, produce fitness evaluation report, produce* a *division system report* and *produce* a *special duty report.* The *produce external reports* process produces the air controllers' monthly report, the officers' special report, the officers' monthly report, the sailors' monthly report and the sailors punishment monthly report.

D. HARDWARE REQUIREMENTS

The system being developed will be implemented on an IBM compatible PC platform found on many Hellenic Navy ships. The minimum hardware configuration is a 386 SX (16 bit architecture) processor running at 25 Mhz, with 2 Mb of RAM and 65 Mb of hard drive.

The following chapter will describe the logical database and application design for SPAS.

IV. LOGICAL DATABASE AND APPLICATION DESIGN FOR SPAS

In this chapter we will discuss the logical database and application design for SPAS. In logical database design, the object model developed in the previous chapter is transformed into a relational schema, in preparation for implementation using a specific DBMS. In application design, the data flow diagrams are used as a basis for developing the menus, forms, and reports for SPAS.

A. LOGICAL DATABASE DESIGN

The seventeen semantic objects describing the user's environment are transformed into nineteen relations. Relationships are represented using foreign keys and are also shown explicitly on the relational diagram. In this diagram, shown in Appendix D, primary keys are underlined and foreign keys are indicated with the superscript ^{FK}. Relations of Appendix D, their attributes, and relationships are discussed in the following sections.

1. Ship Relation

This relation contains information about a ship. It is derived from SHIP object. Its primary key is Hull Number. Other attributes are Ship's Name, Ship's Class, Commanding Officer's Name, Executive Officer's Name, and Higher Command. It has a 1:M mandatory relationship to Department relation.

2. Department Relation

This relation contains information about a department. It is derived from DEPARTMENT object. Its primary key is Department Name. Other attributes are Department Head, Office Location, Phone Number and Hull # (foreign key). It has a M:1 and a 1:M mandatory relationships to Ship and Division relations respectively.

3. Division Relation

This relation contains information about a division. It is derived from DIVISION object. Its primary key is Division Name. Other attributes are Division Officer Name, Office Location, Phone Number and Department Name (foreign key). It has a M:1 and a 1:M mandatory relationships to Division and Person relations respectively.

4. Person Relation

This relation contains information about a person. It is derived from PERSON object. Its primary key is Personal Identification Number. Other attributes are Last Name, First Name, Rank, Rate, Current Position, Previous Position, Date of Change, Specialty, Date of Birth, Address, Nearest Police Station and Phone Number, One Third Crew Division System Number, One Half Crew Division System Number, Session Number, Berthing, Religion, Education, Foreign Languages, Hobbies, Air Control Category, Instructor Air Controller, Division Name (foreign key), Port Duty Station Name (foreign key), and Abandon Ship Station Number (foreign key). It has a M:1 mandatory relationship to Port Duty Station, Division, and Abandon Ship Station relations, a 1:1

optional relationship to Fitness Evaluation, Dependent and Air Control Check, a 1:M mandatory relationship to Promotion, Person-Special Duty, and Person-Special Station relations, a 1:M optional relationship to Disciplinary, Training, Request, Leave, and On the Job Training Evaluation relations.

5. Dependent Relation

This relation contains information about a person's dependent. It is derived from DEPENDENT object. Its primary key is Dependent's Name and Personal Identification Number. Other attributes are Address, Phone Number and Other Dependent Names. It has a 1:1 mandatory relationship to Person relation.

6. Fitness Evaluation Relation

This relation contains information about a person's fitness evaluation. It is derived from FITNESS EVALUATION object. Its primary key is Reference Period for Fitness Evaluation and Personal Identification Number. Other attributes are Start Date, End Date, Grade, and Comment. It has a 1:1 mandatory relationship to Person relation.

7. On the Job Training Evaluation Relation

This relation contains information about a person's OJT evaluation. It is derived from OJT EVALUATION object. Its primary key is Start Date for the OJT Evaluation and Personal Identification Number. Other attributes are End Date, Grade, Comments, Station duty of Qualification, and Officer Performed the Qualification. It has a M:1 mandatory relationship to Person relation.

8. Disciplinary Relation

This relation contains information about a person's Disciplinary actions. It is derived from DISCIPLINARY object. Its primary key is Offence Number and Personal Identification Number. Other attributes are Offence Name, Offence Date, Apology, Punishment, Start Date, End Date, and Reporting Officer. It has a M:1 mandatory relationship to Person relation.

9. Training Relation

This relation contains information about a person's Training. It is derived from TRAINING object. Its primary key is School Name and Personal Identification Number. Other attributes are Date, Degree/Diploma, Number of Participants, Grade, Order among Participants, and Comments. It has a M:1 mandatory relationship to Person relation.

10. Promotion Relation

This relation contains information about a person's Promotion. It is derived from PROMOTION object. Its primary key is Promotion Date and Personal Identification Number. Other attributes are Command Issued the Order, and Date of Issued Order. It has a M:1 mandatory relationship to Person relation.

11. Port Duty Station Relation

This relation contains information about a port duty station. It is derived from PORT DUTY STATION object. Its primary key is Port Duty Station Name. Other attributes are Station Location and Phone Number. It has a 1:M mandatory relationship to Person relation.

12. Air Control Check Relation

This relation contains information about air control checks. It is derived from AIR CONTROL CHECK object. Its primary key is Date, Time, and Type of Aircraft. Other attributes are Type of Control, Duration, Comments and Personal Identification Number (foreign key). It has a 1:M mandatory relationship to Person relation.

13. Request Relation

This relation contains information about a person's requests. It is derived from REQUEST object. Its primary key is Date, Personal Identification Number, and Type of Request. Other attributes are Description, CO's Decision, and Comments. It has a M:1 mandatory relationship to Person relation.

14. Leave Relation

This relation contains information about a person's leave. It is derived from LEAVE object. Its primary key is Date Starts and Personal Identification Number. Other attributes are Date Ends, Type of Leave, Number of Days on leave, Destination, and Comments. It has a M:1 mandatory relationship to Person relation.

15. Abandon Ship Station Relation

This relation contains information about an abandon ship station. It is derived from ABANDON SHIP STATION object. Its primary key is Abandon Ship Station Number. Other attributes are Location, Type of Rescue Vessel, and Capacity. It has a 1:M mandatory relationship to Person relation.

16. Special Station Relation

This relation contains information about a special ship station. It is derived from SPECIAL STATION object. Its primary key is Special Station Type and Special Station Title. Other attributes are Duty, Equipments, and Gathering Position/Location. It has a 1:M mandatory relationship to Person-Special Station relation.

17. Person-Special Station Relation

This relation contains information about a person and his special ship station. It is derived from PERSON and SPECIAL STATION objects. It is an intersection relation that breaks the many to many relationships between person and special station into two 1:M relationships. Its primary key is Personal Identification Number, Special Station Type, and Special Station Title. It has a M:1 mandatory relationship to Person and Special Station relations.

18. Special Duty Relation

This relation contains information about a special ship duty. It is derived from SPECIAL DUTY object. Its primary key is Special Duty Type and Special Duty Title. Other attributes are Duty Instruction, Equipments/Guns and Ammunition, and Gathering Position. It has a 1:M mandatory relationship to Person-Special Duty relation.

19. Person-Special Duty Relation

This relation contains information about a person and his special duty. It is derived from PERSON and SPECIAL DUTY objects. It is an intersection relation that breaks the many to many relationships between person and special duty into two 1:M relationships. Its primary key is Personal Identification Number, Special Duty Type, and Special Duty Title. It has a M:1 mandatory relationship to Person and Special Duty relations.

B. APPLICATION DESIGN

In application design, the data flow diagrams developed in the requirements phase are used as the basis for designing the system's menus, forms, and reports. The following section provides a brief explanation of each.

1. Menus

SPAS is a menu-driven application. The reason for using menus is because they are self explanatory and are therefore easy to use. The menu structure of SPAS follows closely the decomposition diagram developed during process requirements. SPAS menus are shown in Appendix E.

2. Forms

Forms are the user's primary interface with the database. They are used for entering, modifying, and displaying data retrieved from the database. Special care was paid in designing the forms for SPAS. Every effort was made in designing them to be natural, easy to use, and be less prone to errors. SPAS forms are shown in Appendix F.

3. Reports

Reports are the main output that the system generates for distribution to a variety of users. Reports can be sent to the screen, to a file, or to the printer. Similar to designing forms special care was paid in designing the reports for SPAS. Every effort was made in designing them to be natural, logical, close to the format that is currently in use, and less prone to misinterpretation. SPAS reports are shown in Appendix G.

V. IMPLEMENTATION FOR SPAS

In this chapter we will discuss the implementation of the SPAS application and the construction of the database, as well as the installation of both the database and the SPAS application. The Paradox database management system for DOS is introduced and used as the DBMS of choise for SPAS implementation.

Paradox is a fast, full-featured, and easy to use relational database program designed to meet data management needs. Paradox can be used by computer users with all levels of experience from beginning database users to advanced developers. Paradox can be used either on a single computer (standalone) or on a Local Area Network (LAN).

To use Paradox 4.0 on a standalone computer, you will need at a minimum:

- a 100% IBM compatible, protected mode capable 80286 or higher personal computer with a hard disk and a floppy drive
- 2MB extended memory
- DOS 3.0 or higher, or OS/2 2.0
- compatible MDA, MCA, CGA, EGA, VGA, 8514, 3270, ATT, TANDY T1000, or Hercules monitor with adapter
- 5MB of free hard disk space to install Paradox without the optional software and 0.5MB for the optional software
- free hard disk space approximately three times the size of your largest table, to process complex queries

The user interface for Paradox supports multiple windows, pull-down menus, speed bars, dialog boxes, and other graphical user interface components. Paradox provides limited mouse support. For instance, you can't change directories when loading tables by pointing and clicking at a directory tree with the mouse; you have to type your path manually. Paradox's Query By Example (QBE) capability is one of the product's strong features. Complex queries can be run against single or joined tables, and query images can be saved for later use. A variety of exact and inexact queries can be performed, and there is support for wildcards, data ranges, pattern searches, and logical conditions. Phonetic searches can be done with Paradox's "Like" operator. Database administration is handled through Paradox's well-designed user interface which puts all the commands the user needs on easy-to-use menus and provides shortcut keys for many of the choices.

A. DATA IMPLEMENTATION

In data implementation, the relations and their attributes developed during logical database design are transformed into tables and data fields, respectively. Table structures are created in Paradox by choosing *Create* from the menu, and specifying a name for the new table in the dialog box. The structure of the new empty table, which matches the corresponding relation developed during the design phase, is then specified. For each field of the table, its name, field type, and whether it is a key field are entered. Brief descriptions of the field type choices are displayed on the new table creation window to assist the users in creating the new table. The data types supported by Paradox and their abbreviations are: A for alphanumeric fields up to 255 characters in length, M for a memo up to 240 characters in table view, N for numbers, $ for currency amounts, and D for dates. Once the definition of a table is completed, a user can enter values in the table directly or through a form.

B. APPLICATION IMPLEMENTATION

A Paradox application is a series of instructions to Paradox that makes it perform the set of tasks needed to do a specific job. These instructions link menus, forms, queries, and reports into a comprehensive system. In this section we will discuss Paradox query module, form and report generator, and application workshop.

Query module lets the user select, combine, manipulate, and retrieve data in tables. To perform a query, a query form has to be filled out first. This form is related to the table that contains the data. The *Ask* command on the main menu displays the *Query* form. Several forms can be linked together, and the designer is able to retrieve all the information he needs into a single table. He can also set conditions to be satisfied when the query is performed. Setting conditions is a simple action of making the Query form look like an example of the records he likes to retrieve. This is called *Query by Example*. The retrieved data are stored in a temporary table named *Answer*.

Paradox has a form/report generator that allows the programmer to design custom forms and reports. Forms are used to input data one record at a time. A form can have wrapped fields that show the information of a single field on two or more lines. The information in a table image is always arranged in rows and columns, whereas the information on a form can be arranged in a free format. Data fields are highlighted in different colors for easy recognition with a cursor that tabs from one logical data field to the next. Forms are created by choosing *Form, Design* from the menu. Paradox default is a standard tabular formatted form. The designer has the option to design a custom free format form. Appendix F shows SPAS data input forms.

Reports are produced to display the requested information from the database. Each table can have up to 15 reports defined on it. Each report can have up to 2000 characters per line. Reports are created by choosing *Report, Design* from the menu. Paradox default is a standard column report. The designer has the option to design a custom free format report. Appendix G shows SPAS customized reports.

Paradox application workshop helps the programmer to create Paradox Applications easily. The application menus are created through the application workshop. Building the menus and defining what each command menu does is accomplished through the application workshop. The application workshop creates and manages the components of the application. Another way to create these components is by using PAL (Programming Application Language) scripts which is more complex and designed for more advanced applications and experienced programmers. For the development of SPAS application, a combination of both the application workshop and PAL was used.

Appendix H shows the programming code generated by Paradox while building the SPAS application. Part one of the Appendix is the "Menu Structure" that shows the hierarchy of the SPAS application menu structure. Part two is the cross-reference table of "Action Objects & Paradox Objects in Use" that explains in each session what tables are declared, what functions (insert, edit, delete) are performed, and if the specific session is password protected. Part three is the action table menu that describes in detail how each of the actions is performed.

Appendix I provides procedures for installing and operating SPAS.

The next chapter discusses other issues that need to be taken into consideration before SPAS can be fully operational.

VI. OTHER ISSUES

In this chapter important issues concerning the development of the "SPAS" application such as testing, security, training, conversion, maintenance, and future upgrades will be discussed.

A. TESTING

As mentioned in chapter II, testing is critical for the development of the SPAS application. Database management system testing abilities as well SPAS testing strategy will be discussed at this point.

1. Paradox Testing

Paradox is designed to allow the developer to conduct testing through the use of environments. In the "Workshop" environment, after each programming session is implemented the user is able to test the specific module and be assured that it is fully functional without any procedural errors. When the application is finished, it can and must be tested as a whole. Paradox has that feature built in the application workshop under "Application/Test" which tests the application to ensure that everything after the integration works properly.

2. 'SPAS" Testing Strategy

As mentioned in the previous paragraph, Paradox lets the developer test the application at every procedural step. While building each of the action menus, the developer is able to test every action, session, or report, to ensure that everything is working properly, and continue to the next menu for further development. So, in this session, access to all of the tables and forms is ensured, all queries are performed, and everything is verified to be working properly. This "built in" testing procedure in Paradox represents the bottom-up testing strategy that is described in paragraph II.E.2.c. The bottom-up testing technique was performed throughout the development of the SPAS application and each individual process was tested before proceeding to the next higher step in the application's hierarchy. Each subsystem was tested in that way ensuring no functional or procedural errors were present. The whole application was then tested as a complete and integrated system.

B. SPAS SECURITY

Paradox offers a very flexible passwording scheme with table-by-table, script-by-script, and option-by-option password protection. Access to a given table can be limited on a field-by-field basis.

SPAS users will have some access control authorities depending on their rank and their duties onboard the ship. The command is responsible for assigning these duties and for determining each user access control.

SPAS physical security falls under the navy's policy and procedures that enforce rules and activities for the ships' physical security. Moreover, each individual ship command has to take proper measures to protect the hardware resources as well as the software and the applications.

C. TRAINING

One of the most important aspects of the implementation phase is the training plan. The training plan is designed to ensure that every user of the system knows the system's basic functions and how to perform them. The success of any information system depends on the skills of the operators. In the SPAS system, the operators are officers, petty officers and sailors, who are familiar with the procedures on the ship, currently run the system manually, and who only need to be taught how the new system operates. The system itself is designed to be friendly, easy-to-use, and does not require the operator to have any advanced interpersonal skills. However, matching basic human characteristics and skills with a job's requirements is essential, especially when an automated system is to replace a manual one.

The designer's proposal for the training is to start with the main users of the system and train them in the system's environment as well as its functions and operations. The main users of the system are defined as personnel working in the ship's administration office. They are led by the administration officer whose team normally consists of two petty officers and three or four sailors. As soon as every ship has a trained core of system users, training for the rest of the personnel can be held.

D. CONVERSION

The future success of the new system depends on how well and how quickly it is accepted by the users. With SPAS application, it is hoped that because the system is rather small and the users are already familiar with the environment, proper training will minimize these problems. Another way to minimize implementation problems is to select the correct conversion strategy.

1. SPAS Conversion Strategy

For the SPAS application conversion strategy, the pilot approach is proposed. A parallel conversion within two Hellenic Navy ships as pilot units is desired for the following reasons:

- risk is significantly minimized
- testing the system on two ships over a period of time will provide sufficient information to evaluate the system before complete implementation on all ships
- manpower need is reasonable
- surfaced problems can be worked out by the personnel of both ships
- time to shift is predicted to be two months which is a reasonable interval for checking monthly reports and for reassigning personnel from/to the ship

As soon as the system operates sufficiently on the pilot units, a decision for full implementation on all ships can be made.

E. MAINTENANCE

Once the system passes the acceptance test, it is ready for delivery. Any modifications or enhancements after delivery is called maintenance. Attention should be paid to the fact that after a few years of operating the original system, maintenance becomes extremely tedious, error-prone, and expensive. In this case, management should recognize the problem and do a feasibility study on replacing the old system with a new one.

F. FUTURE ENHANCEMENTS

The SPAS system design offers a flexible way for future upgrades. Paradox itself can be distributed on a network and allow applications to be shared among different users. The SPAS system is able to produce all the designed reports in file format. This facility allows ships to electronically transfer their reports as soon as all the commands are connected to a common network.

VII. CONCLUSIONS AND LESSONS LEARNED

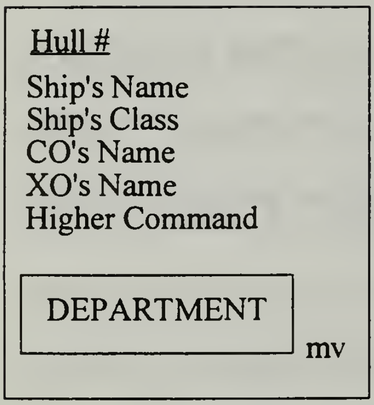
This thesis presented the design, development, partial testing and implementation of the Shipboard Personnel Administration System (SPAS) application on a standalone computer. The SPAS system will provide the Hellenic Navy ships with an automated system to perform their primary administrative functions. SPAS supports this mission by keeping track of all the personnel records, maintaining them, producing reports and providing the command with ad hoc information.

No automated system is currently in use and all the administrative activities are performed by a manual filing system which is slow, inaccurate and prone to errors. The main goal of developing the system is to release manpower to perform other duties, by increasing effectiveness, efficiency, and accuracy of personnel management. After SPAS implementation, it is hoped that most of the current problems will be eliminated, and future enhancements will result in even greater efficiency in performing the personnel administration functions.

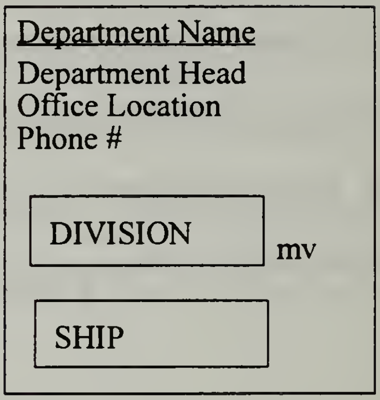
System analysis and design tools and techniques were used to develop the system by modeling the user data and process requirements. Paradox for DOS was used as the database management system for the implementation because it is not only powerful but also meets the system's developmental requirements. The window like, pull-down menu driven environment is easy to use and quick to learn. The user friendly environment will hopefully eliminate the cultural resistance of the user that will result from the requirement to switch from the manual system to an automated one.

It is hoped this thesis will be the motivator for other efforts to develop new systems, and expand or update existing ones in the Hellenic Navy. It is hoped also that the developed system would benefit other services of the Hellenic military and give them the inspiration to develop their own systems following the pre-designed and tested system designed for the Navy and developed in this thesis.

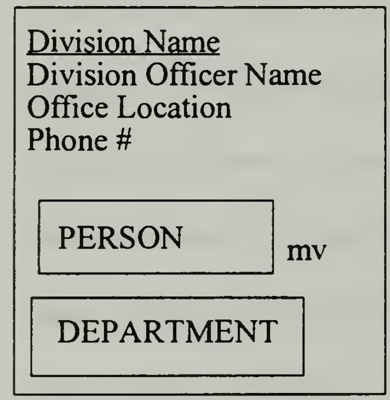
APPENDIX A: SEMANTIC OBJECTS


Hull #
Ship's Name
Ship's Class
CO's Name
XO's Name
Higher Command
DEPARTMENT
mv

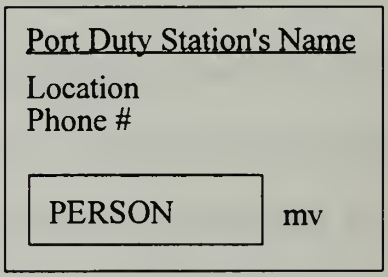
SHIP


Department Name
Department Head
Office Location
Phone #
DIVISION
mv
SHIP

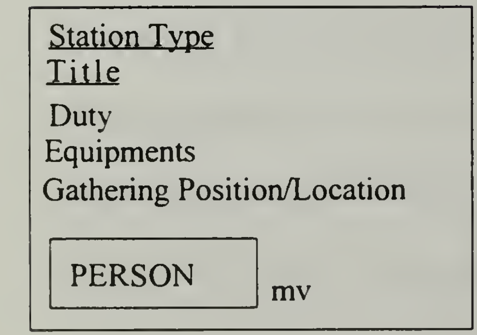
DEPARTMENT


Division Name
Division Officer Name
Office Location
Phone #
PERSON
mv
DEPARTMENT

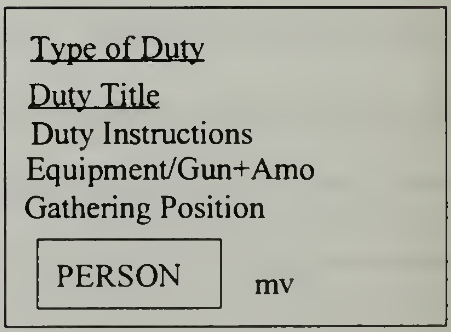
DIVISION


Port Duty Station's Name
Location
Phone #
PERSON
mv

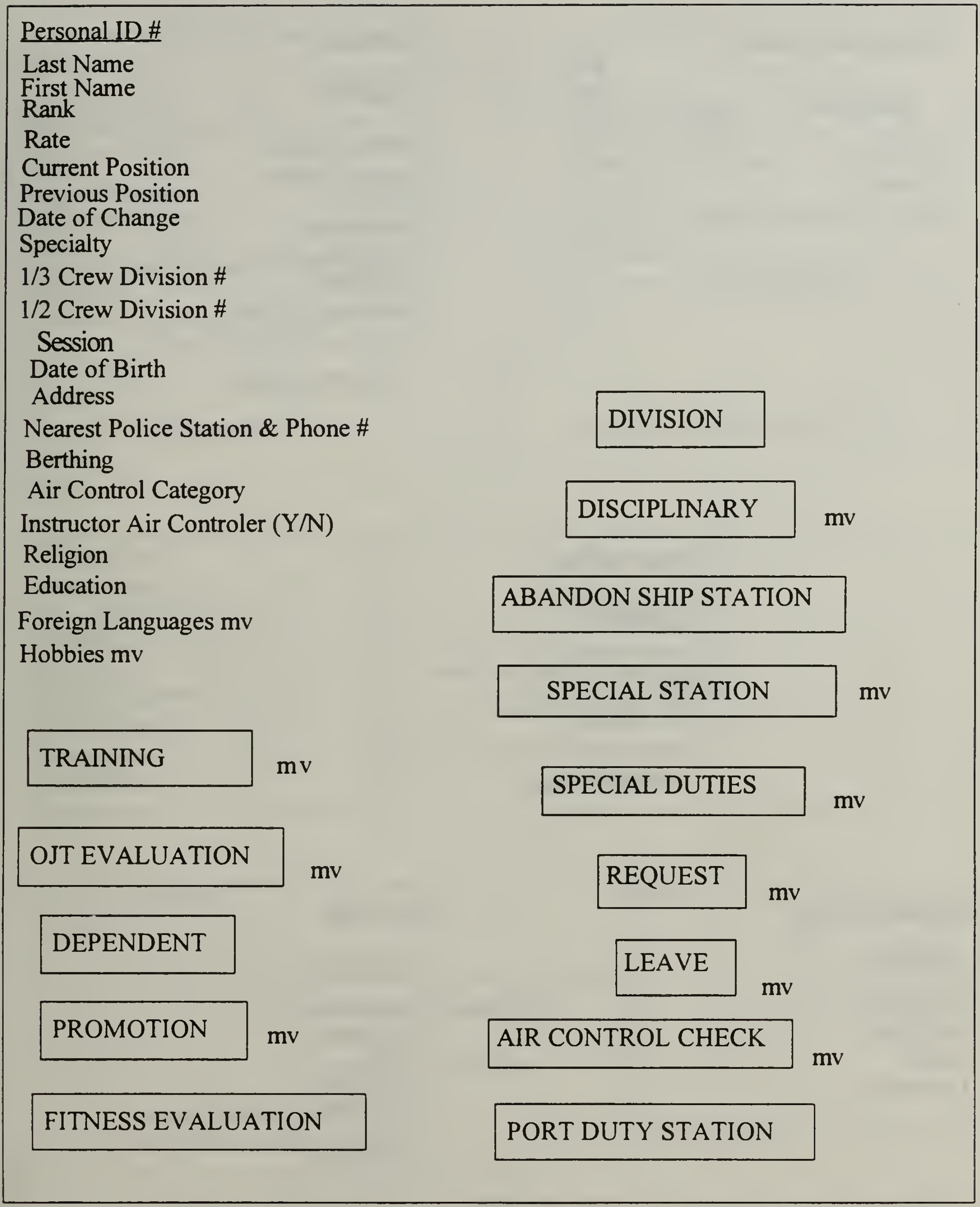
PORT DUTY STATION


Station Type
Title
Duty
Equipments
Gathering Position/Location
PERSON
mv

SPECIAL STATION


Type of Duty
Duty Title
Duty Instructions
Equipment/Gun+Amo
Gathering Position
PERSON
mv

SPECIAL DUTY


Personal ID #
Last Name
First Name
Rank
Rate
Current Position
Previous Position
Date of Change
Specialty
1/3 Crew Division #
1/2 Crew Division #
Session
Date of Birth
Address
Nearest Police Station & Phone #
Berthing
Air Control Category
Instructor Air Controler (Y/N)
Religion
Education
Foreign Languages mv
Hobbies mv
DIVISION
DISCIPLINARY
mv
ABANDON SHIP STATION
SPECIAL STATION
mv
TRAINING
mv
SPECIAL DUTIES
mv
OJT EVALUATION
mv
REQUEST
mv
DEPENDENT
LEAVE
mv
PROMOTION
mv
AIR CONTROL CHECK
mv
FITNESS EVALUATION
PORT DUTY STATION

PERSON

Dependent's Name

PERSON

Address
Phone #
Other Depentent's Name

DEPENDENT

Offence #

PERSON

Offence Name
Date of Offence
Apology
Punishment
Start Date
End Date
Reporting Officer

DISCIPLINARY

Promotion Date

PERSON

Command Issued the Order
Date of Issued Order

PROMOTION

Reference Period

PERSON

Start Date
End Date
Grade
Comments

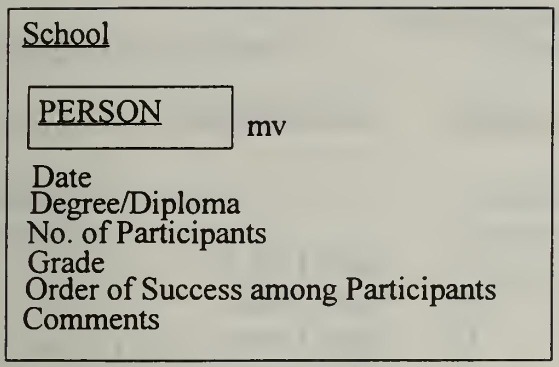
FITNESS EVALUATION

Start Date

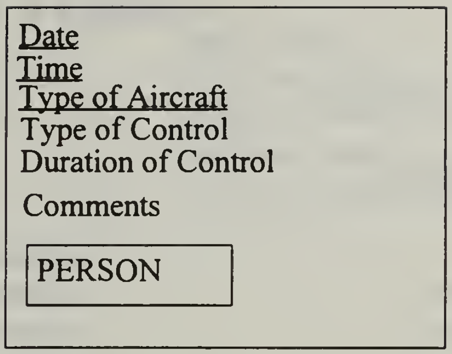
PERSON

End Date
Grade
Comments
Station Duty of Qualification
Officer Performed the Qual.

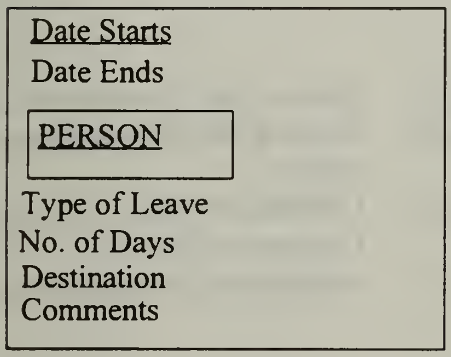
OJT EVALUATION


School
PERSON
mv
Date
Degree/Diploma
No. of Participants
Grade
Order of Success among Participants
Comments

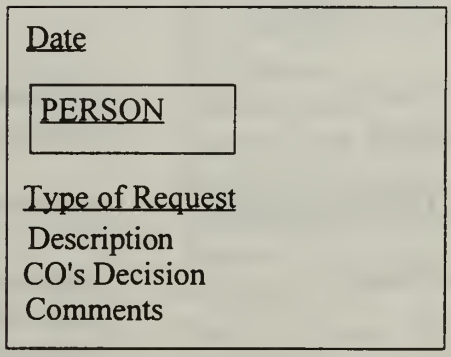
TRAINING


Date
Time
Type of Aircraft
Type of Control
Duration of Control
Comments
PERSON

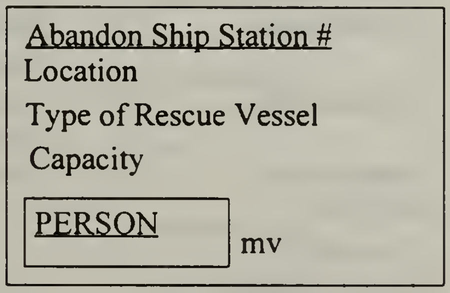
AIR CONTROL CHECK


Date Starts
Date Ends
PERSON
Type of Leave
No. of Days
Destination
Comments

LEAVE


Date
PERSON
Type of Request
Description
CO's Decision
Comments

REQUEST


Abandon Ship Station #
Location
Type of Rescue Vessel
Capacity
PERSON
mv

ABANDON SHIP STATION

APPENDIX B: DATA DICTIONARY

ELEMENT	TYPE	WIDTH	DESCRIPTION
SHIP OBJECT			
Hull #	:Alphanumeric	5	Ship's Hull #.
Ship's Name	:Alphanumeric	15	Ship's Name.
Ship's Class	:Alphanumeric	15	Ship's Class.
CO's Name	:Alphanumeric	25	CO's Name.
XO's Name	:Alphanumeric	25	XO's Name.
Higher Command	:Alphanumeric	10	Higher Command that the ship belongs to.
DEPATRMENT	:DEPARTMENT object; MV		
DEPARTMENT OBJECT			
Department Name	:Alphanumeric	15	Name of the Department.
Department Head	:Alphanumeric	25	Name of the Department Officer.
Department Office Location	:Alphanumeric	10	Location of the Department Office.
Department Phone #	:Alphanumeric	5	Department Office Phone #.
SHIP	:SHIP object		
DIVISION	:DIVISION object; MV		
DIVISION OBJECT			
Division Name	:Alphanumeric	15	Name of the Division.
Division Officer Name	:Alphanumeric	25	Name of the Division Officer.
Division Office Location	:Alphanumeric	10	Location of the Division Office.
Division Phone #	:Alphanumeric	5	Division Office Phone #.
PERSON	:PERSON object; MV		
DEPARTMENT	:DEPARTMENT object		

PORT DUTY STATION OBJECT

Port Duty Station Name	:Alphanumeric	15	Name of the Port Duty Station.
Location	:Alphanumeric	10	Location of the Port Duty Station.
Phone #	:Alphanumeric	5	Port Duty Station Phone #
PERSON	:PERSON object; MV		

PERSON OBJECT

Personal ID #	:Alphanumeric	10	Person's Identification Number.
Last Name	:Alphanumeric	15	Person's Last Name.
First Name	:Alphanumeric	15	Person's First Name.
Rank	:Alphanumeric	1	Person's Rank: O: if Officer, P: if Pety Of., S: if Sailor.
Rate	:Alphanumeric	7	Person's Rate.
Current Position	:Alphanumeric	15	Crewmember Current Position of his Job.
Previous Position	:Alphanumeric	15	Crewmember Previous Position of his Job.
Date of Change	:Date	6	mm/dd/yy Date of Change from Previous Position to Current Position.
Specialty	:Alphanumeric	15	Person's Specialty.
1/3 Crew Division Number	:Alphanumeric	1	Number of "1/3 Crew Division System".
1/2 Crew Division Number	:Alphanumeric	1	Number of "1/2 Crew Division System".
Session Number	:Alphanumeric	1	Number of XO's Daily Session.
Date of Birth	:Date	6	Person's DoB, mm/dd/yy.
Address	:Alphanumeric	30	Person's Home Address.
Nearest Police Station & Phone #	:Alphanumeric	50	Police Station closest to Person's Home.
Berthing	:Alphanumeric	10	Person's Berthing Place.

Air Control Category	:Alphanumeric	1	Category of the Air Controller. (if the person is, "N" if he is not).
Instructor Air Controller	:Alphanumeric	1	"Y" if he is Instructor, "N" if he is not.
Religion	:Alphanumeric	12	Person's Religion.
Education	:Alphanumeric	12	Person's Undergraduate Education.
Foreign Languages	:Alphanumeric	25	Foreign Languages spoken by the Person.
Hobbies	:Alphanumeric	25	Person's Hobbies.
TRAINING	:TRAINING object; MV		
OJT EVALUATION	:OJT EVALUATION object; MV		
DEPENDENT	:DEPENDENT object		
PROMOTION	:PROMOTION object; MV		
FITNESS EVALUATION	:FITNESS EVALUATION object		
DIVISION	:DIVISION object		
DISCIPLINARY	:DISCIPLINARY object; MV		
ABNDON SHIP STATION	:ABANDON SHIP STATION object		
SPECIAL STATION	:SPECIAL STATION object; MV		
SPECIAL DUTY	:SPECIAL DUTY object; MV		
REQUEST	:REQUEST object; MV		
LEAVE	:LEAVE object; MV		
AIR CONTROL CHECK	:AIR CONTROL CHECK object; MV		
PORT DUTY STATION	:PORT DUTY STATION object		

DEPENDENTS OBJECT

Dependent's Name	:Alphanumeric	25	Name of Person's Closest Dependent.
Dependent's Address	:Alphanumeric	25	Address of the Dependent.
Dependent's Phone #	:Alphanumeric	10	Dependent's Phone #.
Other Dependents' Name	:Alphanumeric	30	Names of Other Possible Dependents.
PERSON	:PERSON object		

DISCIPLINARY OBJECT

Offence #	:Alphanumeric	4	Number of the Offence:"mmdd".
Offence Name	:Alphanumeric	20	Name of the Offence.
Date of Offence	:Date	6	mm/dd/yy
Apology	:Memo	100	Person's Apology.
Punishment	:Alphanumeric	3	Imposed Punishment.
Start Date	:Date	6	mm/dd/yy
End Date	:Date	6	mm/dd/yy
Reporting Officer	:Alphanumeric	25	Name of the Reporting Officer.
PERSON	:PERSON object		

PROMOTION OBJECT

Promotion Date	:Date	6	mm/dd/yy
Command Issued the Order	:Alphanumeric	10	Higher Command Issued the Promotion Order.
Date of Issued Order	:Date	6	mm/dd/yy
PERSON	:PERSON object		

FITNESS EVALUATION OBJECT

Reference Period	:Alphanumeric	4	Period that Fitness Evaluation is referred to: (mmyy).
Start Date	:Date	6	mm/dd/yy
End Date	:Date	6	mm/dd/yy
Grade	:Alphanumeric	1	"P":if Pass; "F":if Fail.

Comments	:Memo	50	Any possible comments.
PERSON	:PERSON object		

OJT EVALUATION OBJECT

Start Date	:Date	6	mm/dd/yy
End Date	:Date	6	mm/dd/yy
Grade	:Alphanumeric	1	"P":if Pass; "F":if Fail.
Comments	:Memo	50	Any possible comments.
Station Duty of Qualification	:Alphanumeric	15	Duty Station that Person is Qualified for.
Officer Performed the Qualification	:Alphanumeric	25	Name of the Officer Performed the Qualification.
PERSON	:PERSON object		

TRAINING OBJECT

School	:Alphanumeric	15	School that Person has Participated.
Date	:Date	6	mm/dd/yy
Degree/Diploma	:Alphanumeric	20	Degree or Diploma achieved.
No. of Participants	:Alphanumeric	2	Number of Persons Participated at the specific School.
Grade	:Alphanumeric	3	Grade achieved in percentage %
Order of Success among Participants	:Alphanumeric	2	Person's Order of Success among the Participants.
Comments	:Memo	50	Any possible comments.
PERSON	:PERSON object; MV		

AIR CONTROL CHECK OBJECT

Date	:Date	6	mm/dd/yy
Time	:Alphanumeric	4	Time that Control was performed (hhmm).
Type of Aircraft	:Alphanumeric	10	Type of Aircraft Controlled.

Type of Control	:Alphanumeric	1	Type of Control for the Flight; "P" :Positive; "A" :Advisory; "T" :Tactical Directions; "F" :Free/No Control.
Duration of Control	:Alphanumeric	4	Duration time of Control (hhmm).
Comments	:Memo	50	Any possible comments.
PERSON	:PERSON object		

LEAVE OBJECT

Date Starts	:Date	6	mm/dd/yy
Date Ends	:Date	6	mm/dd/yy
Type of Leave	:Alphanumeric	15	Type of Leave.
No. of Days	:Alphanumeric	2	No. of Days on Leave.
Destination	:Alphanumeric	25	Location of the Person during his Leave.
Comments	:Memo	50	Any possible comments.
PERSON	:PERSON object		

REQUEST OBJECT

Type of Request	:Alphanumeric	15	Type of Request that a Person could have.
Date	:Date	6	mm/dd/yy
Description	:Memo	30	Short Description of Person's Request.
CO's Decision	:Alphanumeric	1	CO's Decision; "Y" if Yes, "N" in No.
Comments	:Memo	50	Any possible comments.
PERSON	:PERSON object		

SPECIAL DUTY OBJECT

Type of Duty	:Alphanumeric	20	Type of Special Duty.
Duty Title	:Alphanumeric	15	Title of Special Duty.
Duty Instructions	:Memo	30	Given Special Instructions.
Equipment/Gun+Amo	:Memo	30	Any Equipments, Gun+Amo carried.
Gathering Position	:Alphanumeric	10	Location of the Gathering Station.

PERSON	:PERSON object; MV		

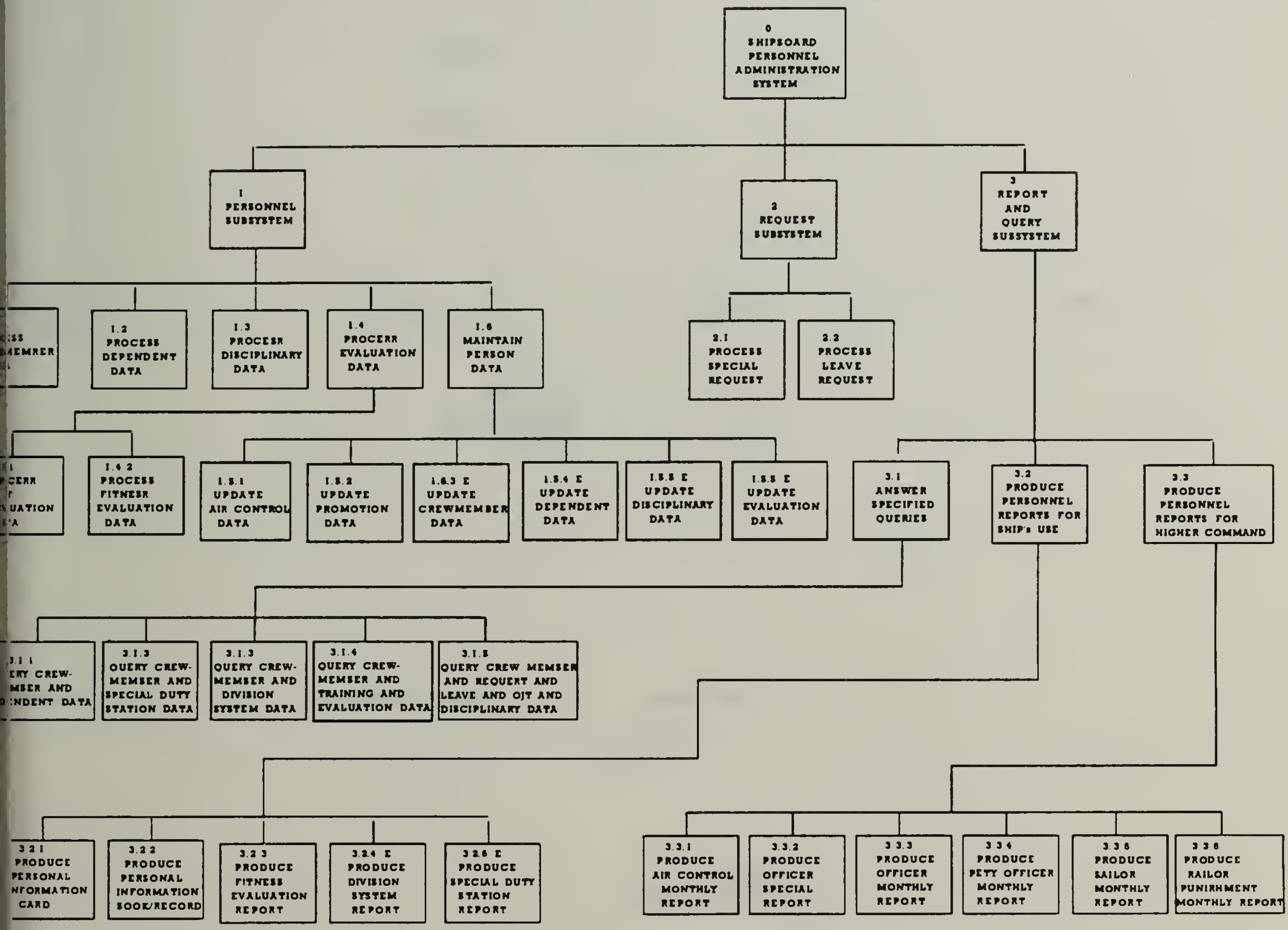
SPECIAL STATION OBJECT

Station Type	:Alphanumeric	20	Type of Special Station.
Title	:Alphanumeric	15	Title of Special Station.
Duty	:Alphanumeric	20	Assigned Duty.
Equipment	:Memo	30	Any Equipments carried.
Gathering Position/Location	:Alphanumeric	10	Location of the Gathering Station.
PERSON	:PERSON object; MV		

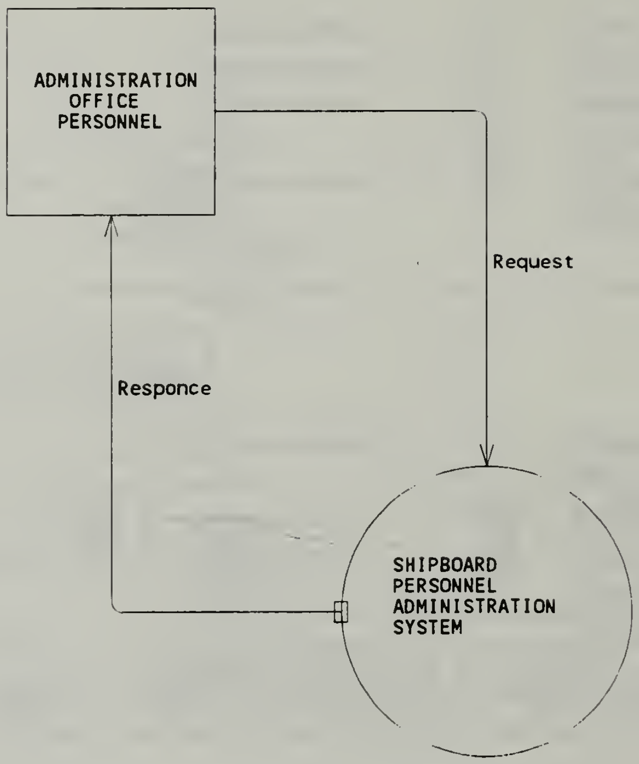
ABANDON SHIP STATION OBJECT

Station Number	:Alphanumeric	3	Number of the Abandon Ship Station.
Location	:Alphanumeric	10	Location of the Station.
Type of Rescue Vessel	:Alphanumeric	20	Type of the Rescue Vessel.
Capacity	:Number	2	Capacity of the Rescue Vessel.
PERSON	:PERSON object		

APPENDIX C: DATA FLOW DIAGRAMS

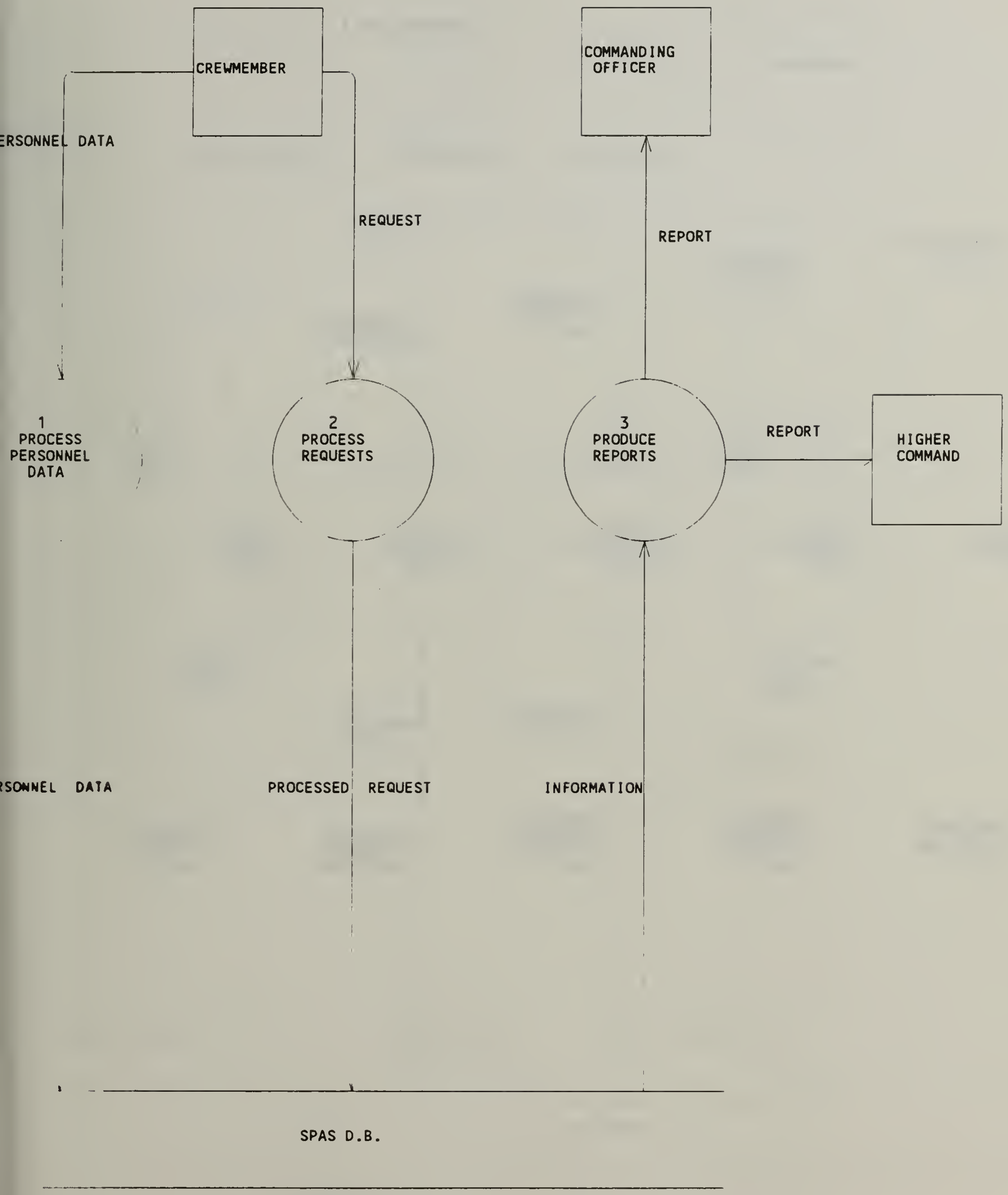

0 SHIPBOARD PERSONNEL ADMINISTRATION SYSTEM
1 PERSONNEL SUBSYSTEM
2 REQUEST SUBSYSTEM
3 REPORT AND QUERY SUBSYSTEM
ESS MEMBER
1.2 PROCESS DEPENDENT DATA
1.3 PROCESS DISCIPLINARY DATA
1.4 PROCESS EVALUATION DATA
1.5 MAINTAIN PERSON DATA
2.1 PROCESS SPECIAL REQUEST
2.2 PROCESS LEAVE REQUEST
CESS UATION
1.4.2 PROCESS FITNESS EVALUATION DATA
1.5.1 UPDATE AIR CONTROL DATA
1.5.2 UPDATE PROMOTION DATA
1.5.3 E UPDATE CREWMEMBER DATA
1.5.4 E UPDATE DEPENDENT DATA
1.5.5 E UPDATE DISCIPLINARY DATA
1.5.6 E UPDATE EVALUATION DATA
3.1 ANSWER SPECIFIED QUERIES
3.2 PRODUCE PERSONNEL REPORTS FOR SHIP's USE
3.3 PRODUCE PERSONNEL REPORTS FOR HIGHER COMMAND
3.1.1 ERY CREW-MBER AND NDENT DATA
3.1.2 QUERY CREW-MEMBER AND SPECIAL DUTY STATION DATA
3.1.3 QUERY CREW-MEMBER AND DIVISION SYSTEM DATA
3.1.4 QUERY CREW-MEMBER AND TRAINING AND EVALUATION DATA
3.1.5 QUERY CREW MEMBER AND REQUEST AND LEAVE AND OJT AND DISCIPLINARY DATA
3.2.1 PRODUCE PERSONAL NFORMATION CARD
3.2.2 PRODUCE PERSONAL INFORMATION BOOK/RECORD
3.2.3 PRODUCE FITNESS EVALUATION REPORT
3.2.4 E PRODUCE DIVISION SYSTEM REPORT
3.2.5 E PRODUCE SPECIAL DUTY STATION REPORT
3.3.1 PRODUCE AIR CONTROL MONTHLY REPORT
3.3.2 PRODUCE OFFICER SPECIAL REPORT
3.3.3 PRODUCE OFFICER MONTHLY REPORT
3.3.4 PRODUCE PETY OFFICER MONTHLY REPORT
3.3.5 PRODUCE SAILOR MONTHLY REPORT
3.3.6 PRODUCE SAILOR PUNISHMENT MONTHLY REPORT

Project : B:\DFD\
Chart : context
Filename : context.dfd
Last modified on : Apr-27-1994
by User : Tsongas George


ADMINISTRATION
OFFICE
PERSONNEL
Request
Responce
SHIPBOARD
PERSONNEL
ADMINISTRATION
SYSTEM

PROCESS 0
SPAS CONTEXT DIAGRAM

: B:\DFD\
lvl1sys
: lvl1sys.dfd
ified on : Apr-27-1994
: Tsongas George


CREWMEMBER
COMMANDING OFFICER
ERSONNEL DATA
REQUEST
REPORT
1 PROCESS PERSONNEL DATA
2 PROCESS REQUESTS
3 PRODUCE REPORTS
REPORT
HIGHER COMMAND
SONNEL DATA
PROCESSED REQUEST
INFORMATION
SPAS D.B.

PROCESSES 1,2,3
LEVEL ONE

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Chart : lvl2p1
Filename : lvl2p1.dfd
Last modified on : Apr-27-1994
 by User : Tsongas George
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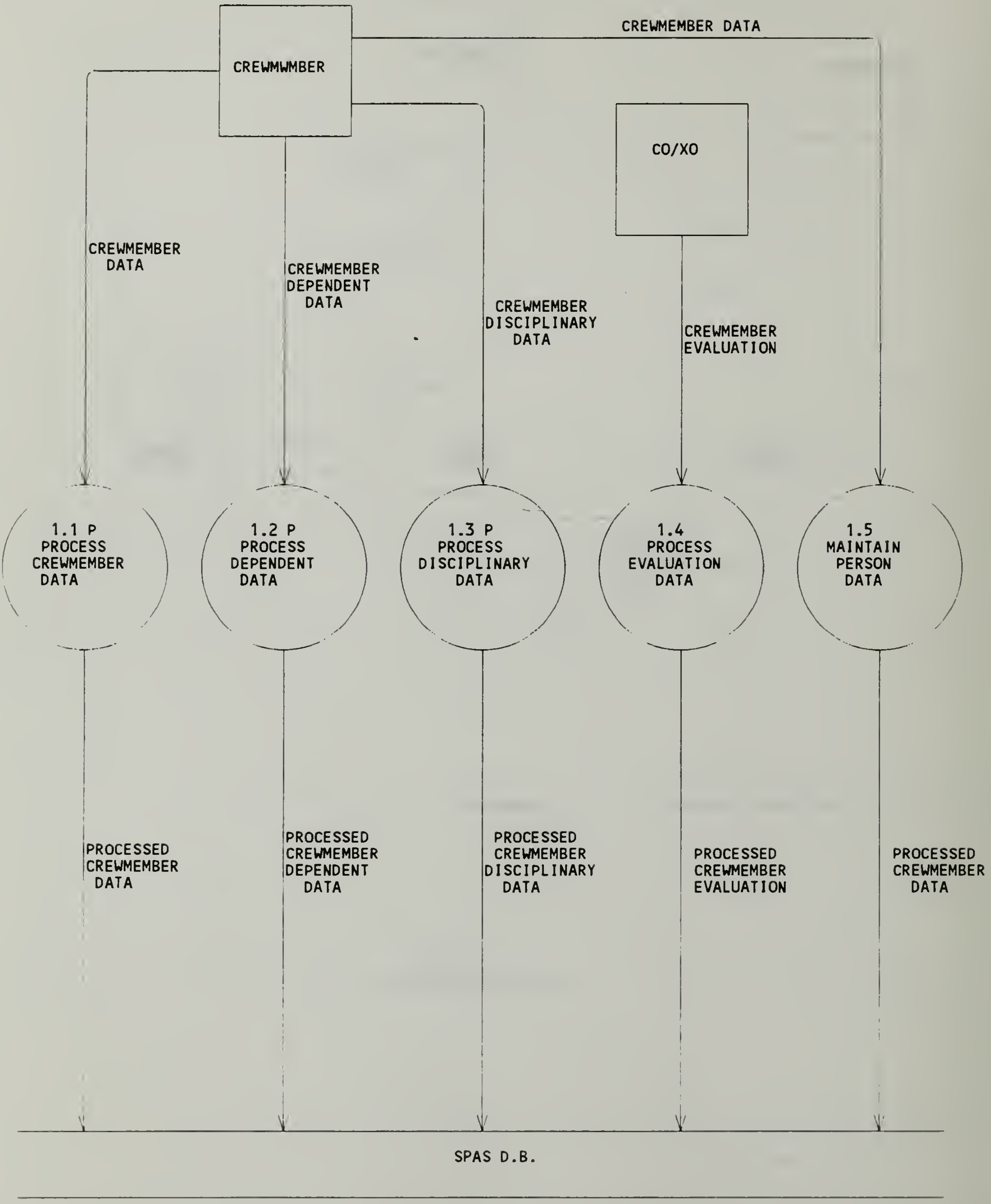
CREWMWMBER
CREWMEMBER DATA
CO/XO
CREWMEMBER DATA
CREWMEMBER DEPENDENT DATA
CREWMEMBER DISCIPLINARY DATA
CREWMEMBER EVALUATION
1.1 P PROCESS CREWMEMBER DATA
1.2 P PROCESS DEPENDENT DATA
1.3 P PROCESS DISCIPLINARY DATA
1.4 PROCESS EVALUATION DATA
1.5 MAINTAIN PERSON DATA
PROCESSED CREWMEMBER DATA
PROCESSED CREWMEMBER DEPENDENT DATA
PROCESSED CREWMEMBER DISCIPLINARY DATA
PROCESSED CREWMEMBER EVALUATION
PROCESSED CREWMEMBER DATA
SPAS D.B.

: B:\DFD\
lvl2p2
e : lvl2p2.dfd
dified on : Apr-27-1994
r : Tsongas George

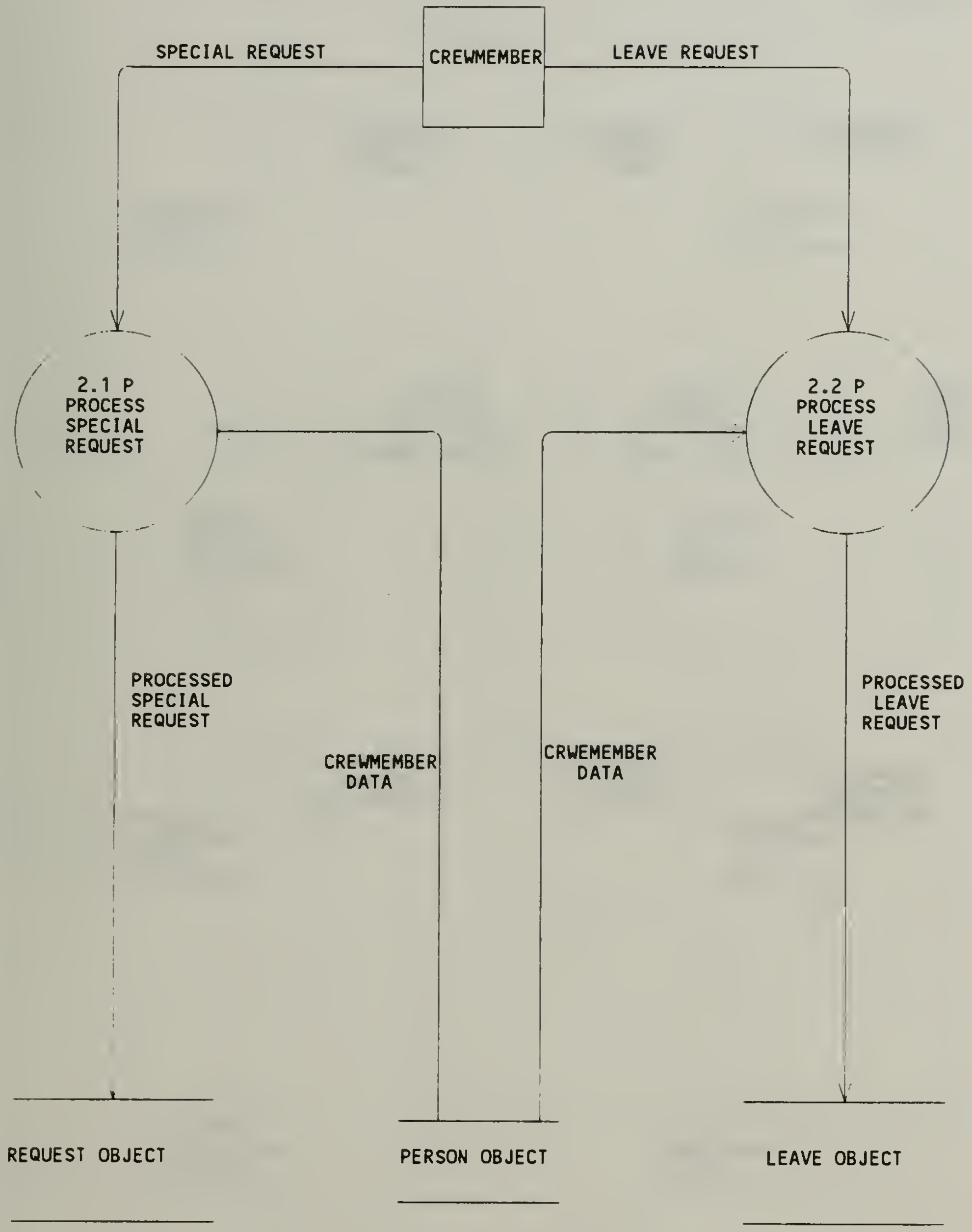
CREWMEMBER
SPECIAL REQUEST
LEAVE REQUEST
2.1 P
PROCESS
SPECIAL
REQUEST
2.2 P
PROCESS
LEAVE
REQUEST
PROCESSED
SPECIAL
REQUEST
CREWMEMBER
DATA
CRWEMEMBER
DATA
PROCESSED
LEAVE
REQUEST
REQUEST OBJECT
PERSON OBJECT
LEAVE OBJECT

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Chart : lvl2p3
Filename : lvl2p3.dfd
Last modified on : Apr-27-1994
 by User : Tsongas George
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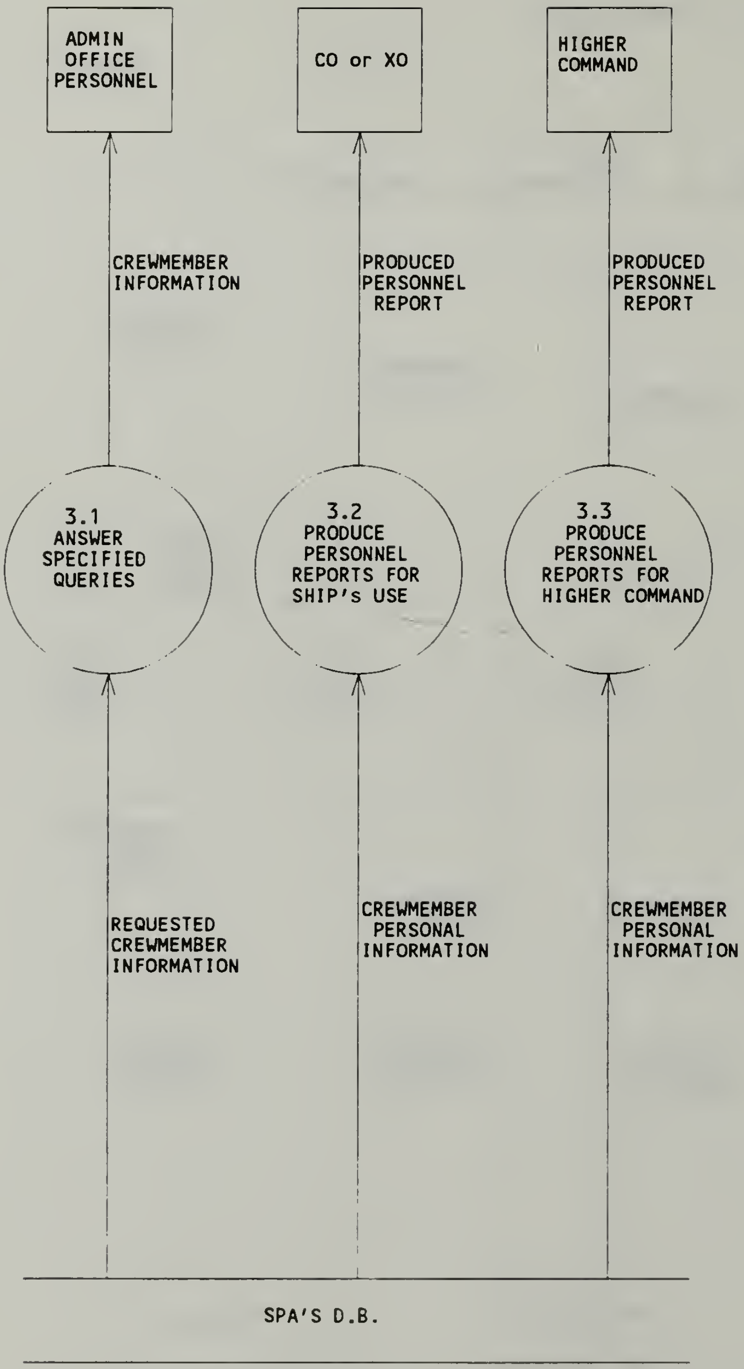
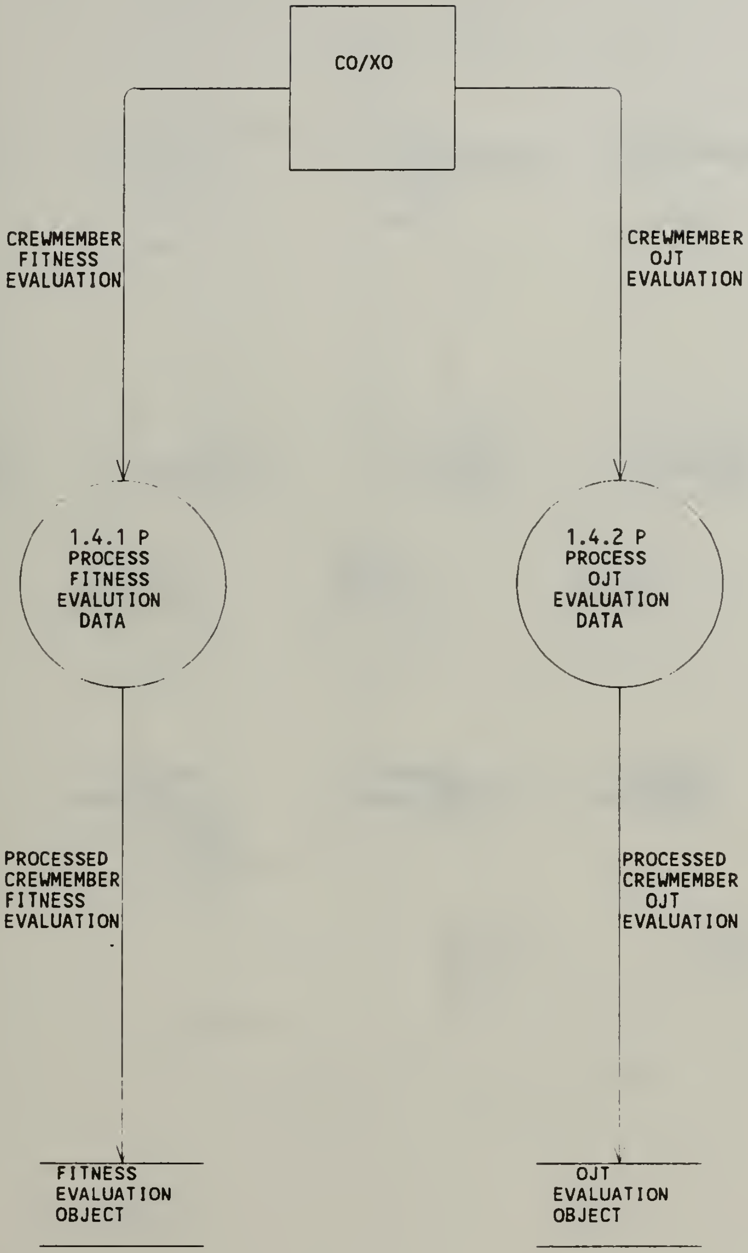
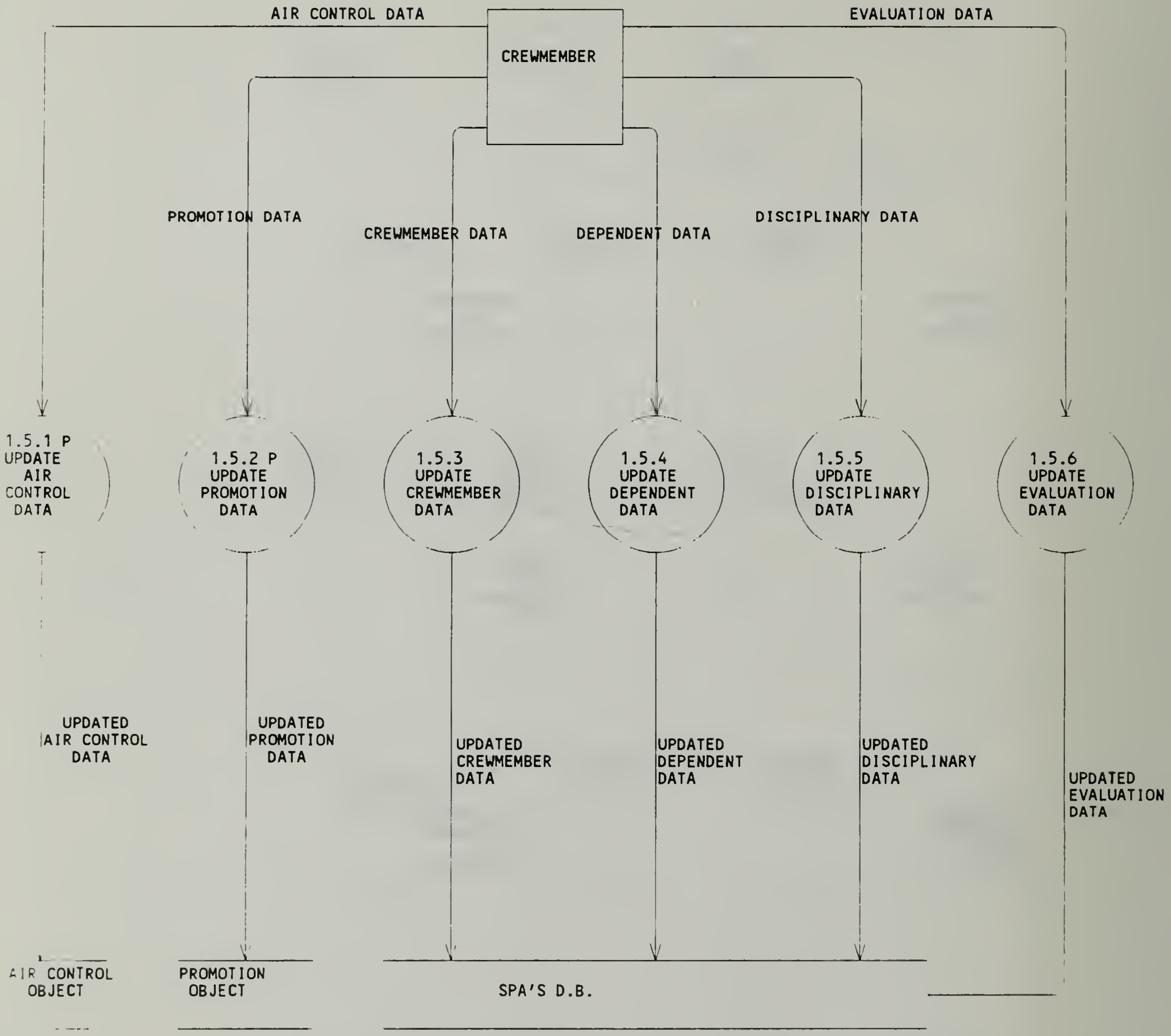

ADMIN OFFICE PERSONNEL
CO or XO
HIGHER COMMAND
CREWMEMBER INFORMATION
PRODUCED PERSONNEL REPORT
PRODUCED PERSONNEL REPORT
3.1 ANSWER SPECIFIED QUERIES
3.2 PRODUCE PERSONNEL REPORTS FOR SHIP's USE
3.3 PRODUCE PERSONNEL REPORTS FOR HIGHER COMMAND
REQUESTED CREWMEMBER INFORMATION
CREWMEMBER PERSONAL INFORMATION
CREWMEMBER PERSONAL INFORMATION
SPA'S D.B.

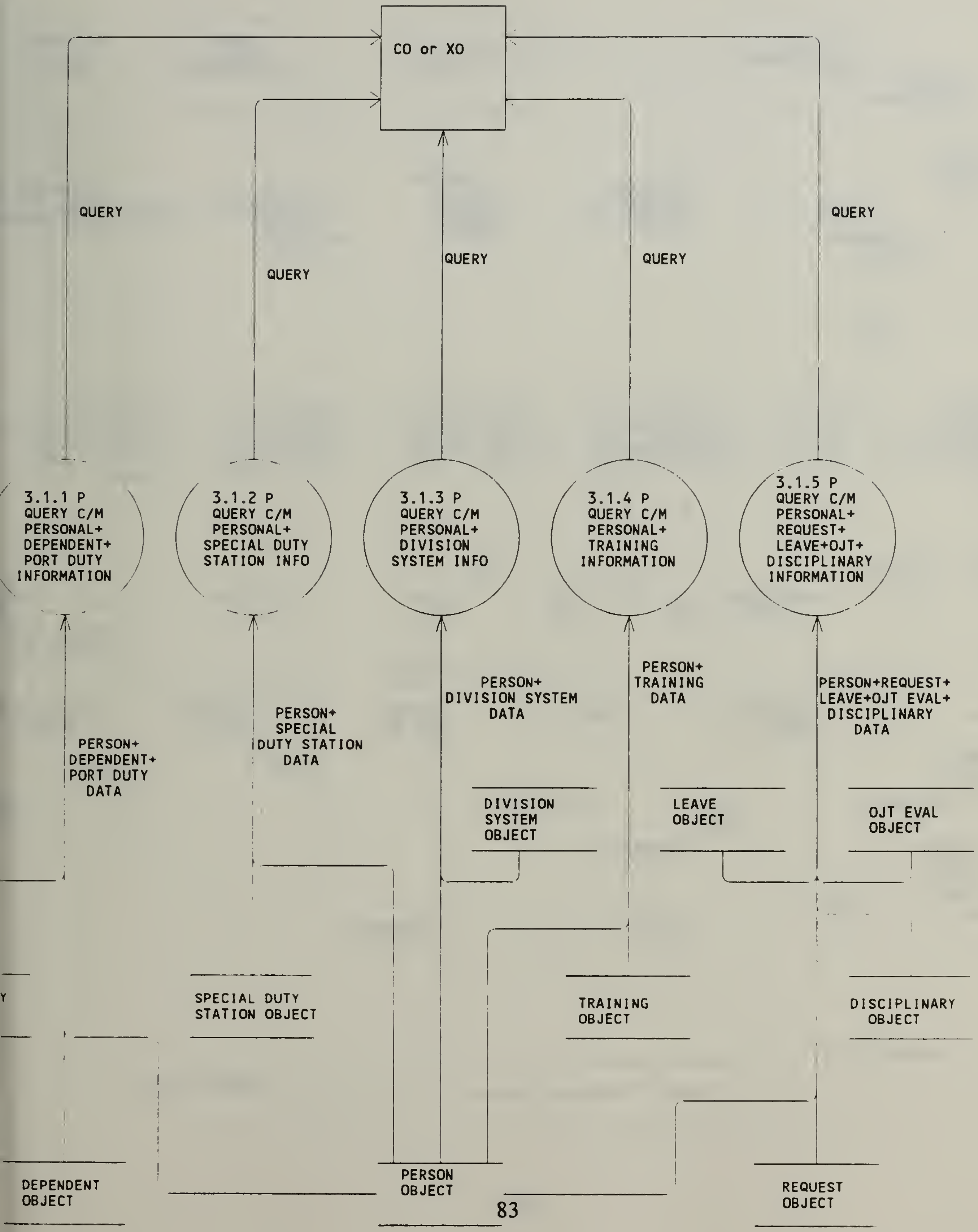
: B:\DFD\
lvl3p14
e : lvl3p14.dfd
dified on : Apr-27-1994
r : Tsongas George


CO/XO
CREWMEMBER FITNESS EVALUATION
CREWMEMBER OJT EVALUATION
1.4.1 P PROCESS FITNESS EVALUTION DATA
1.4.2 P PROCESS OJT EVALUATION DATA
PROCESSED CREWMEMBER FITNESS EVALUATION
PROCESSED CREWMEMBER OJT EVALUATION
FITNESS EVALUATION OBJECT
OJT EVALUATION OBJECT

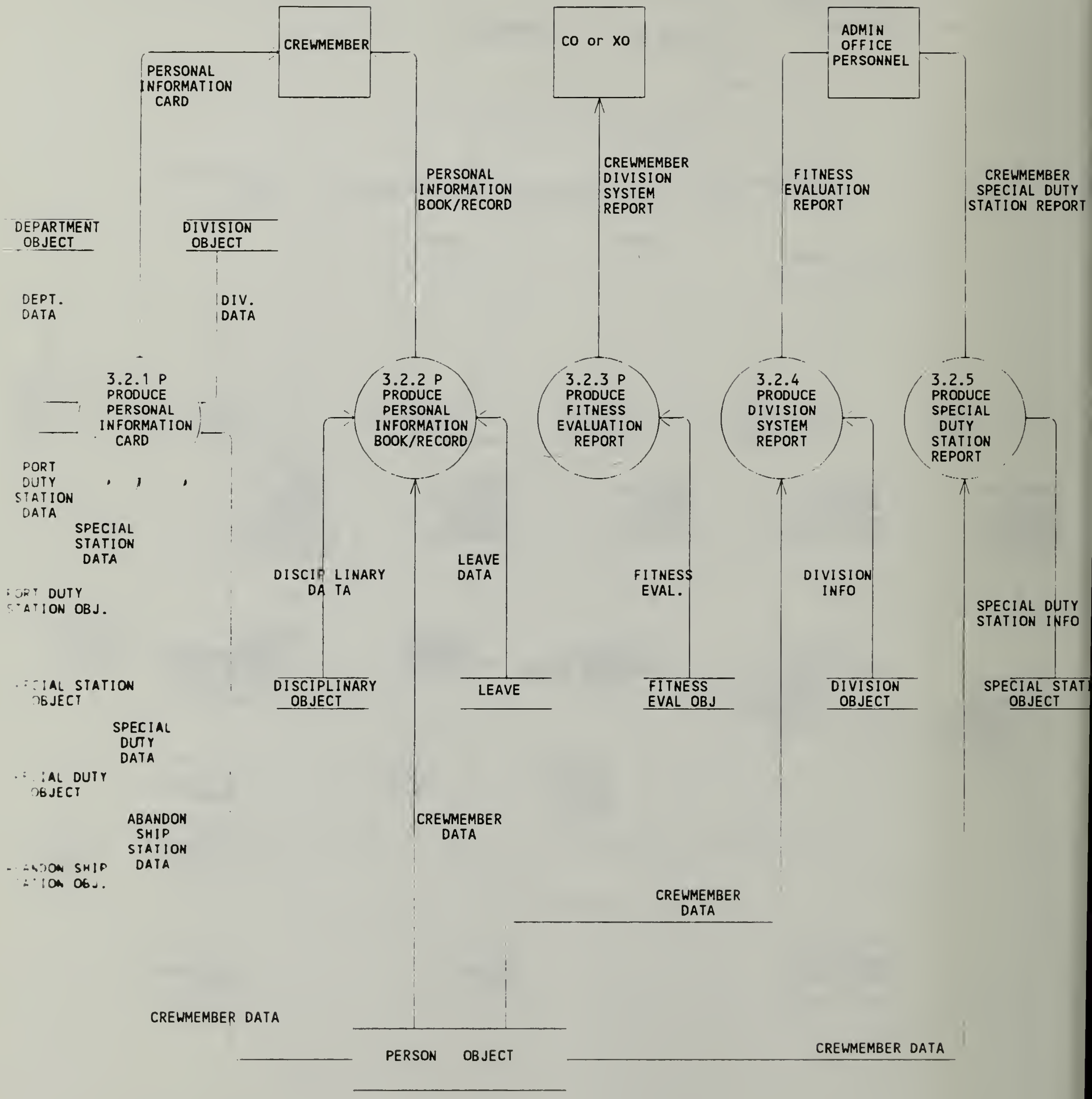
Project : B:\DFD\
Chart : lvl3p15
Filename : lvl3p15.dfd
Last modified on : Apr-27-1994
by User : Tsongas George


AIR CONTROL DATA
CREWMEMBER
EVALUATION DATA
PROMOTION DATA
CREWMEMBER DATA
DEPENDENT DATA
DISCIPLINARY DATA
1.5.1 P UPDATE AIR CONTROL DATA
1.5.2 P UPDATE PROMOTION DATA
1.5.3 UPDATE CREWMEMBER DATA
1.5.4 UPDATE DEPENDENT DATA
1.5.5 UPDATE DISCIPLINARY DATA
1.5.6 UPDATE EVALUATION DATA
UPDATED AIR CONTROL DATA
UPDATED PROMOTION DATA
UPDATED CREWMEMBER DATA
UPDATED DEPENDENT DATA
UPDATED DISCIPLINARY DATA
UPDATED EVALUATION DATA
AIR CONTROL OBJECT
PROMOTION OBJECT
SPA'S D.B.

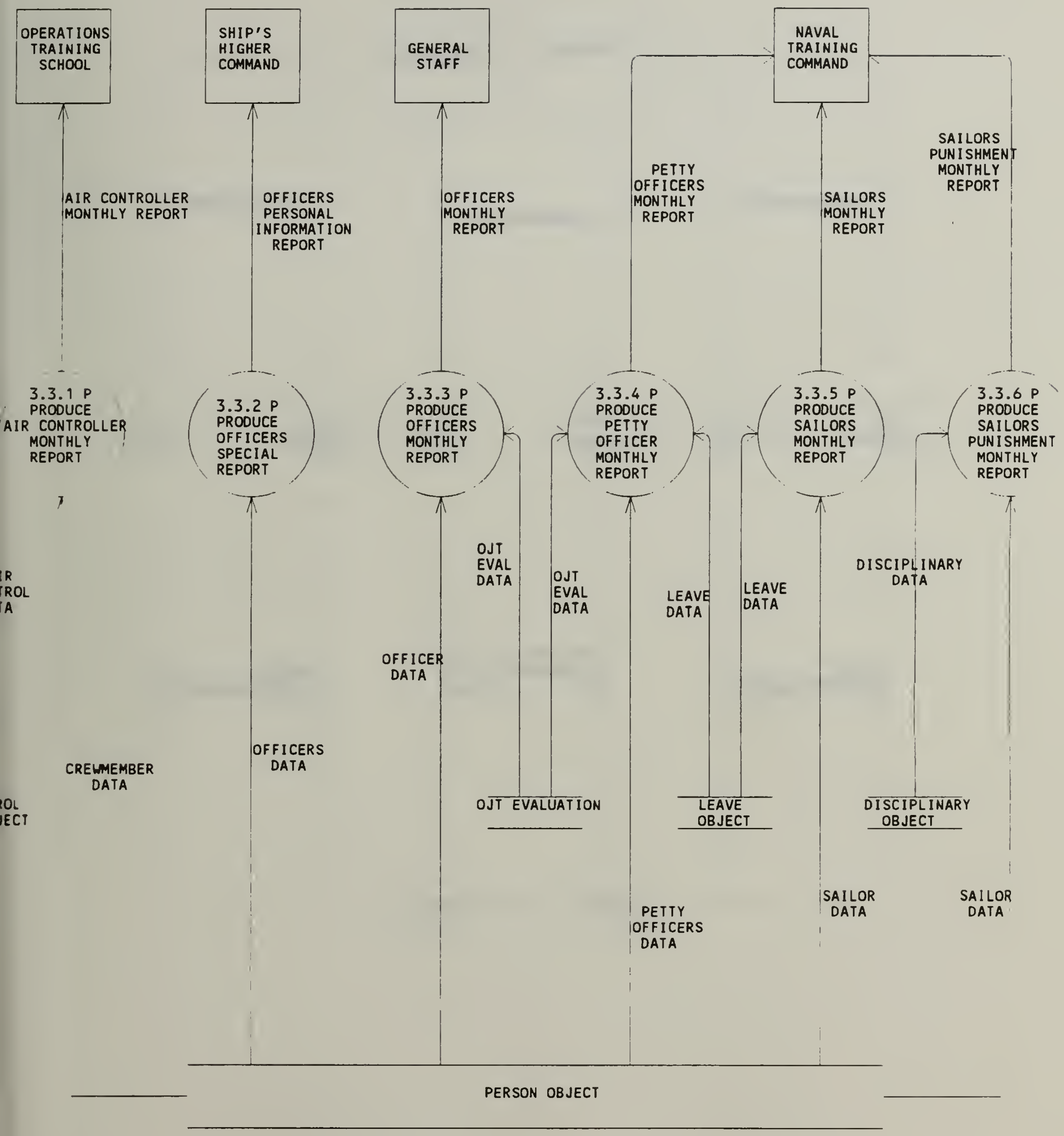
: B:\DFD\
lvl3p31
e : lvl3p31.dfd
dified on : Apr-27-1994
r : Tsongas George


CO or XO
QUERY
QUERY
QUERY
QUERY
QUERY
3.1.1 P QUERY C/M PERSONAL+ DEPENDENT+ PORT DUTY INFORMATION
3.1.2 P QUERY C/M PERSONAL+ SPECIAL DUTY STATION INFO
3.1.3 P QUERY C/M PERSONAL+ DIVISION SYSTEM INFO
3.1.4 P QUERY C/M PERSONAL+ TRAINING INFORMATION
3.1.5 P QUERY C/M PERSONAL+ REQUEST+ LEAVE+OJT+ DISCIPLINARY INFORMATION
PERSON+ DEPENDENT+ PORT DUTY DATA
PERSON+ SPECIAL DUTY STATION DATA
PERSON+ DIVISION SYSTEM DATA
PERSON+ TRAINING DATA
PERSON+REQUEST+ LEAVE+OJT EVAL+ DISCIPLINARY DATA
DIVISION SYSTEM OBJECT
LEAVE OBJECT
OJT EVAL OBJECT
Y
SPECIAL DUTY STATION OBJECT
TRAINING OBJECT
DISCIPLINARY OBJECT
DEPENDENT OBJECT
PERSON OBJECT
REQUEST OBJECT

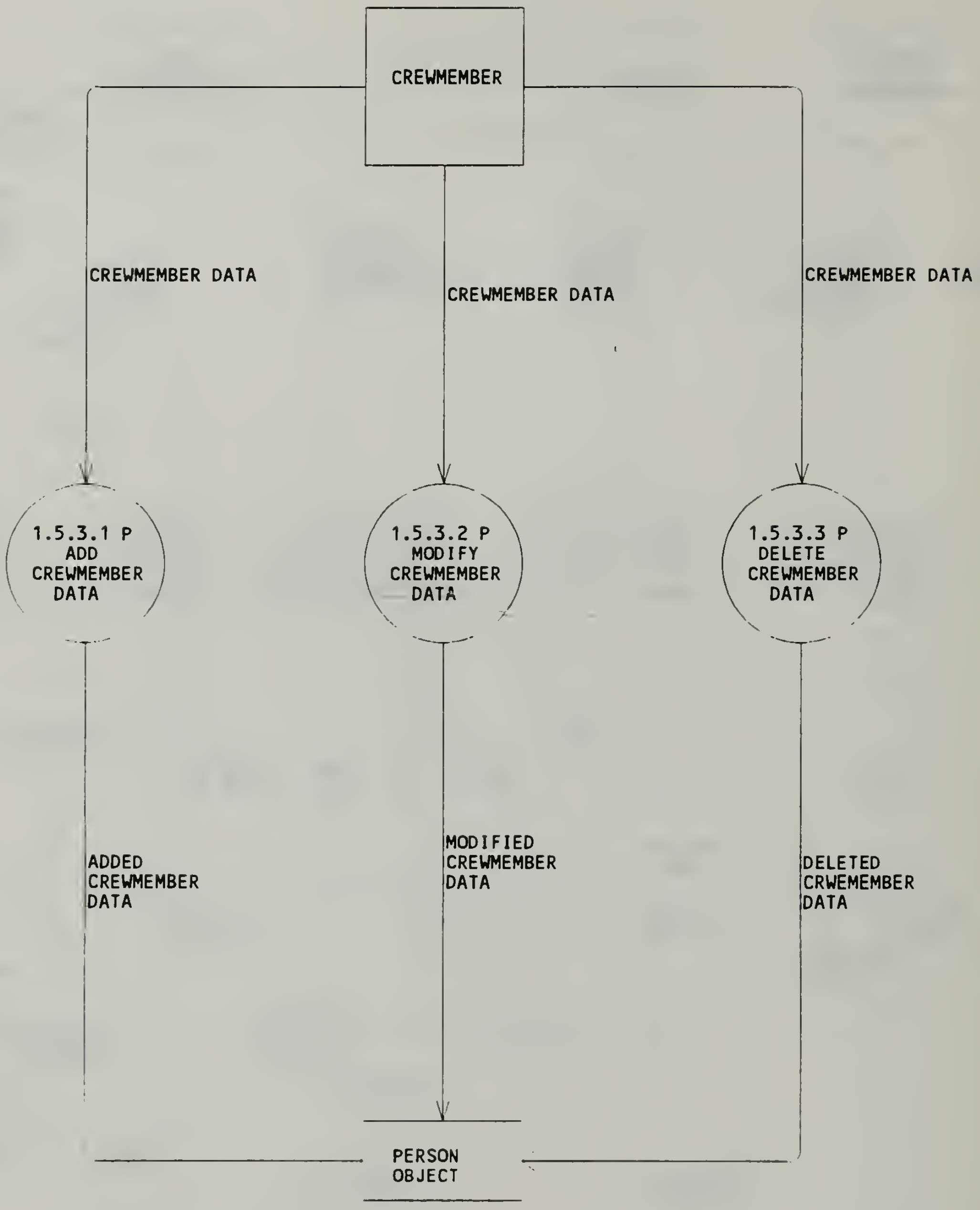
Project : B:\DFD\
Chart : lvl3p32
Filename : lvl3p32.dfd
Last modified on : Apr-27-1994
by User : Tsongas George

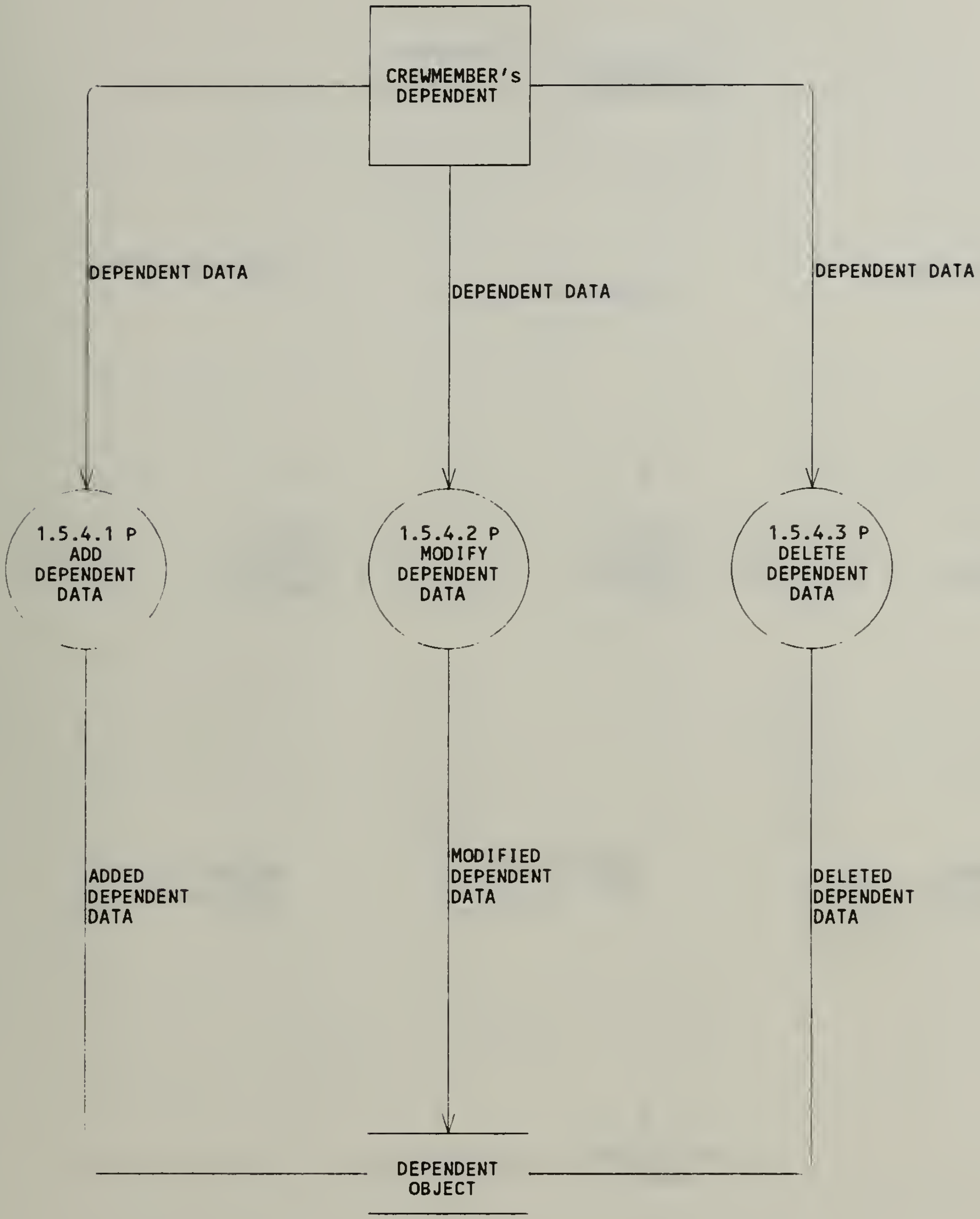

CREWMEMBER
CO or XO
ADMIN OFFICE PERSONNEL
PERSONAL INFORMATION CARD
PERSONAL INFORMATION BOOK/RECORD
CREWMEMBER DIVISION SYSTEM REPORT
FITNESS EVALUATION REPORT
CREWMEMBER SPECIAL DUTY STATION REPORT
DEPARTMENT OBJECT
DIVISION OBJECT
DEPT. DATA
DIV. DATA
3.2.1 P PRODUCE PERSONAL INFORMATION CARD
3.2.2 P PRODUCE PERSONAL INFORMATION BOOK/RECORD
3.2.3 P PRODUCE FITNESS EVALUATION REPORT
3.2.4 PRODUCE DIVISION SYSTEM REPORT
3.2.5 PRODUCE SPECIAL DUTY STATION REPORT
PORT DUTY STATION DATA
SPECIAL STATION DATA
PORT DUTY STATION OBJ.
DISCIPLINARY DATA
LEAVE DATA
FITNESS EVAL.
DIVISION INFO
SPECIAL DUTY STATION INFO
SPECIAL STATION OBJECT
DISCIPLINARY OBJECT
LEAVE
FITNESS EVAL OBJ
DIVISION OBJECT
SPECIAL STATI OBJECT
SPECIAL DUTY DATA
SPECIAL DUTY OBJECT
ABANDON SHIP STATION DATA
ABANDON SHIP STATION OBJ.
CREWMEMBER DATA
CREWMEMBER DATA
CREWMEMBER DATA
PERSON OBJECT
CREWMEMBER DATA

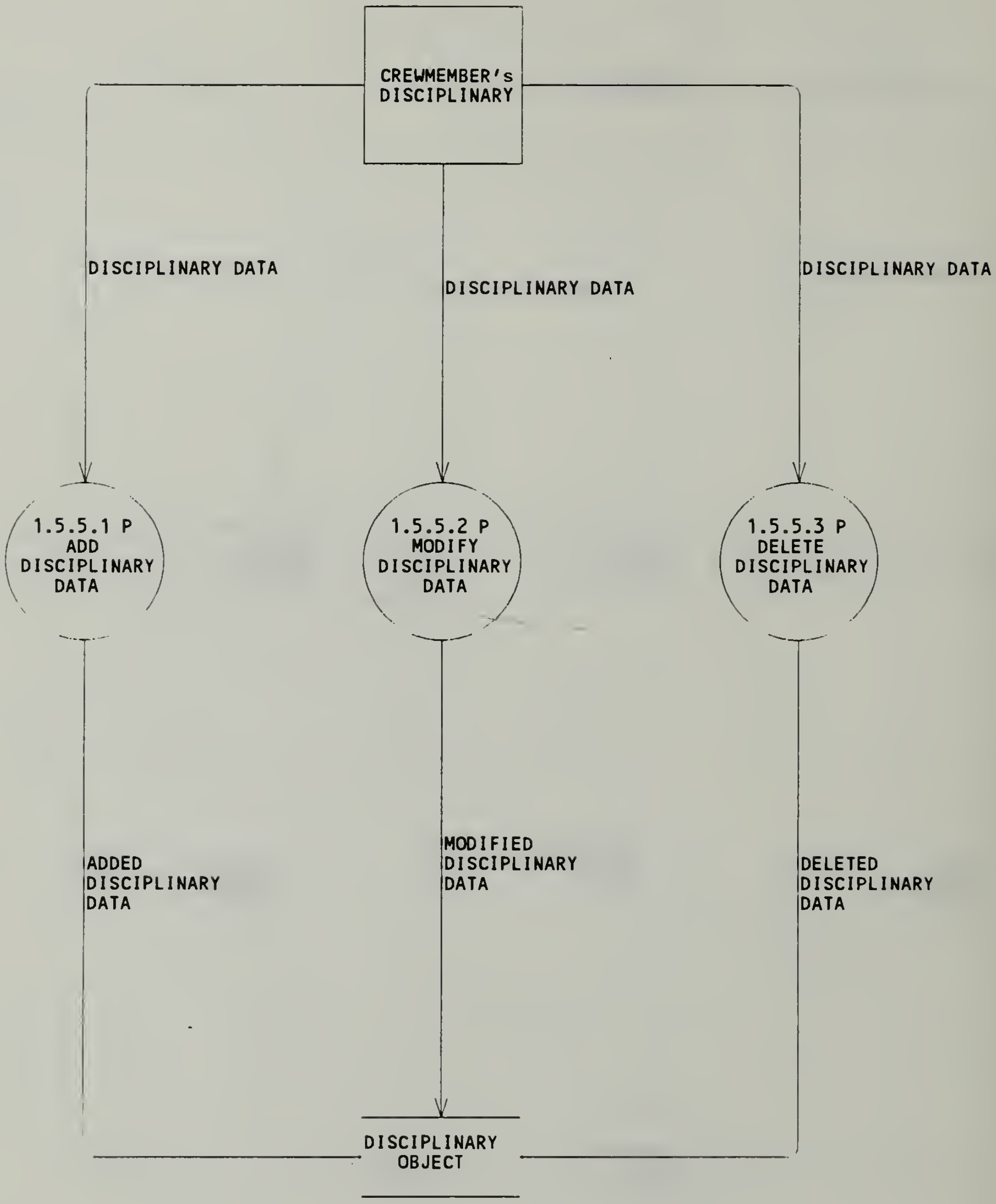
: B:\DFD\
lvl3p33
e : lvl3p33.dfd
lified on : Apr-27-1994
: Tsongas George

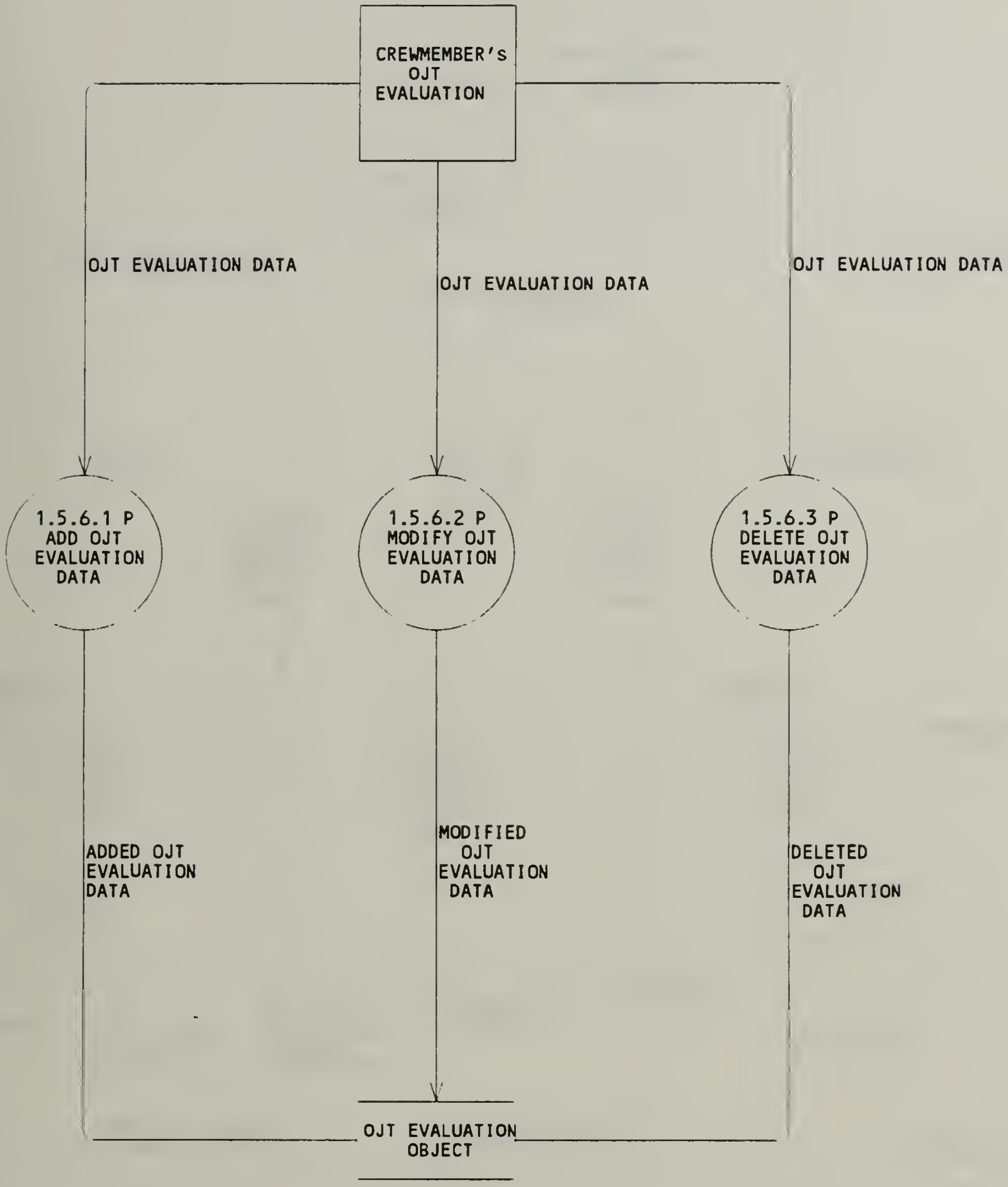

OPERATIONS TRAINING SCHOOL
SHIP'S HIGHER COMMAND
GENERAL STAFF
NAVAL TRAINING COMMAND
AIR CONTROLLER MONTHLY REPORT
OFFICERS PERSONAL INFORMATION REPORT
OFFICERS MONTHLY REPORT
PETTY OFFICERS MONTHLY REPORT
SAILORS MONTHLY REPORT
SAILORS PUNISHMENT MONTHLY REPORT
3.3.1 P PRODUCE AIR CONTROLLER MONTHLY REPORT
3.3.2 P PRODUCE OFFICERS SPECIAL REPORT
3.3.3 P PRODUCE OFFICERS MONTHLY REPORT
3.3.4 P PRODUCE PETTY OFFICER MONTHLY REPORT
3.3.5 P PRODUCE SAILORS MONTHLY REPORT
3.3.6 P PRODUCE SAILORS PUNISHMENT MONTHLY REPORT
OJT EVAL DATA
OJT EVAL DATA
LEAVE DATA
LEAVE DATA
DISCIPLINARY DATA
IR TROL TA
OFFICER DATA
OFFICERS DATA
CREWMEMBER DATA
ROL JECT
OJT EVALUATION
LEAVE OBJECT
DISCIPLINARY OBJECT
SAILOR DATA
SAILOR DATA
PETTY OFFICERS DATA
PERSON OBJECT

Project : B:\DFD\
Chart : lvl4p15
Filename : lvl4p15.dfd
Last modified on : Apr-27-1994
by User : Tsongas George

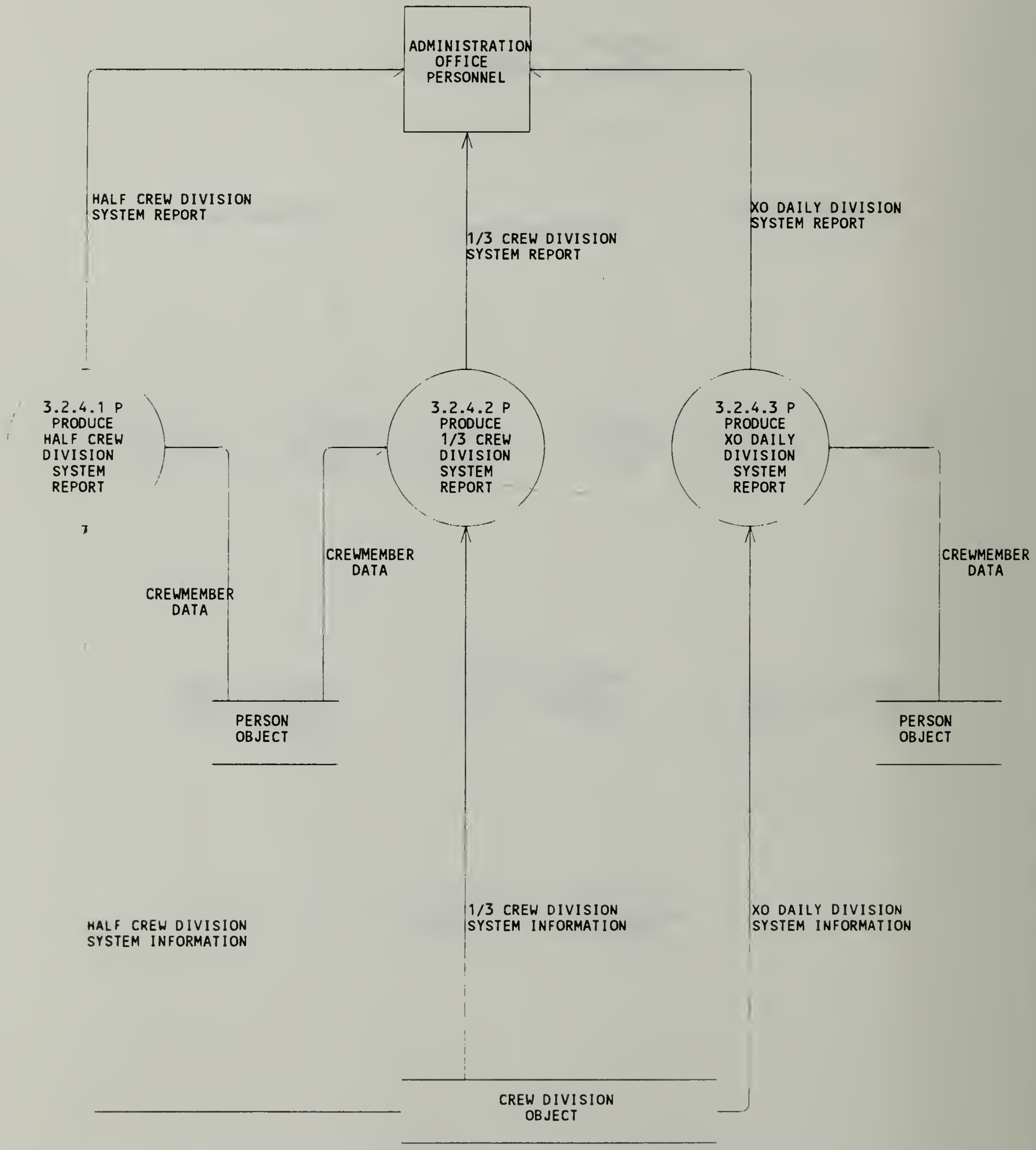

CREWMEMBER
CREWMEMBER DATA
CREWMEMBER DATA
CREWMEMBER DATA
1.5.3.1 P
ADD
CREWMEMBER
DATA
1.5.3.2 P
MODIFY
CREWMEMBER
DATA
1.5.3.3 P
DELETE
CREWMEMBER
DATA
ADDED
CREWMEMBER
DATA
MODIFIED
CREWMEMBER
DATA
DELETED
CRWEMEMBER
DATA
PERSON
OBJECT


CREWMEMBER's DEPENDENT
DEPENDENT DATA
DEPENDENT DATA
DEPENDENT DATA
1.5.4.1 P ADD DEPENDENT DATA
1.5.4.2 P MODIFY DEPENDENT DATA
1.5.4.3 P DELETE DEPENDENT DATA
ADDED DEPENDENT DATA
MODIFIED DEPENDENT DATA
DELETED DEPENDENT DATA
DEPENDENT OBJECT

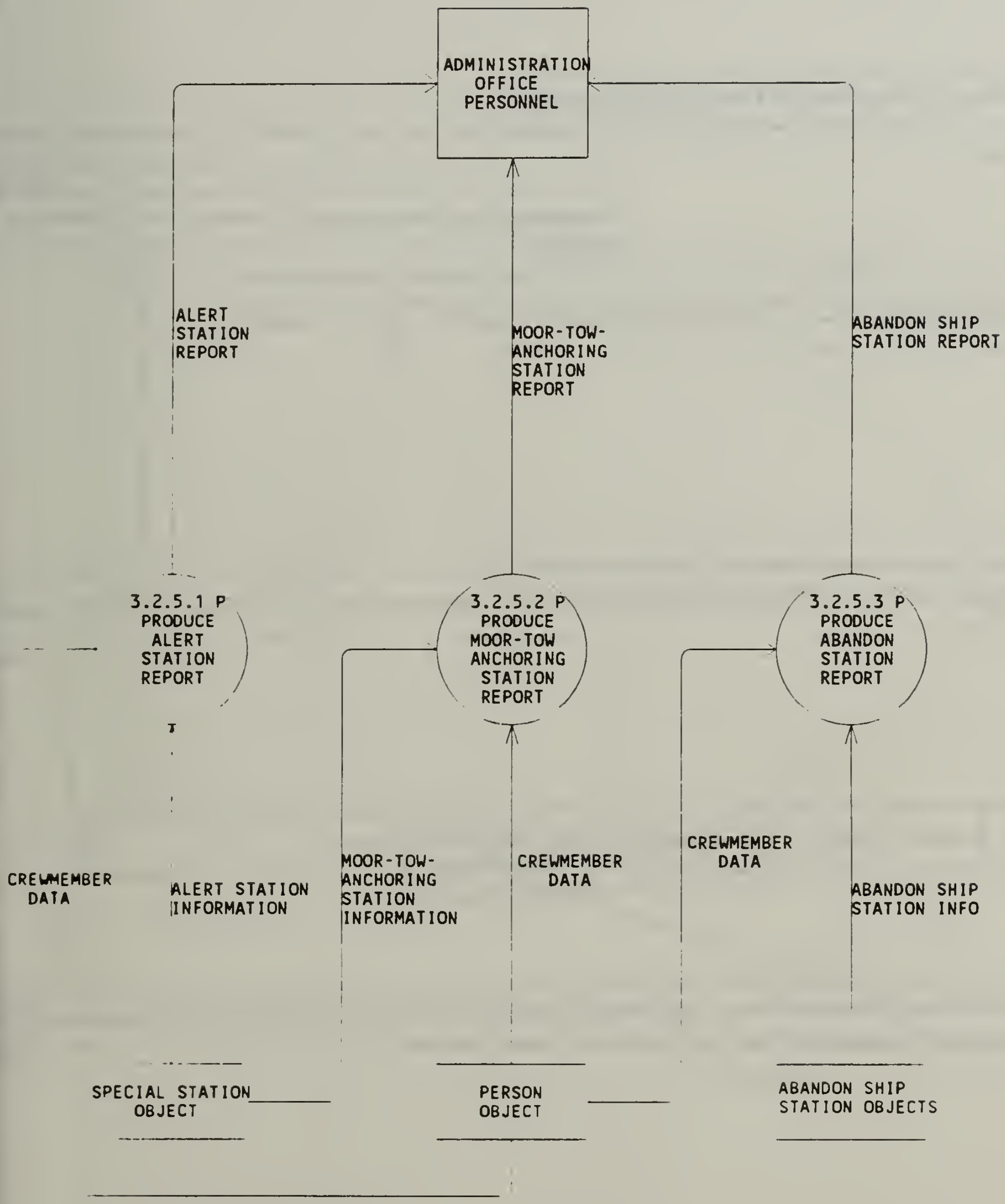

CREWMEMBER's DISCIPLINARY
DISCIPLINARY DATA
DISCIPLINARY DATA
DISCIPLINARY DATA
1.5.5.1 P ADD DISCIPLINARY DATA
1.5.5.2 P MODIFY DISCIPLINARY DATA
1.5.5.3 P DELETE DISCIPLINARY DATA
ADDED DISCIPLINARY DATA
MODIFIED DISCIPLINARY DATA
DELETED DISCIPLINARY DATA
DISCIPLINARY OBJECT


CREWMEMBER's OJT EVALUATION
OJT EVALUATION DATA
OJT EVALUATION DATA
OJT EVALUATION DATA
1.5.6.1 P ADD OJT EVALUATION DATA
1.5.6.2 P MODIFY OJT EVALUATION DATA
1.5.6.3 P DELETE OJT EVALUATION DATA
ADDED OJT EVALUATION DATA
MODIFIED OJT EVALUATION DATA
DELETED OJT EVALUATION DATA
OJT EVALUATION OBJECT

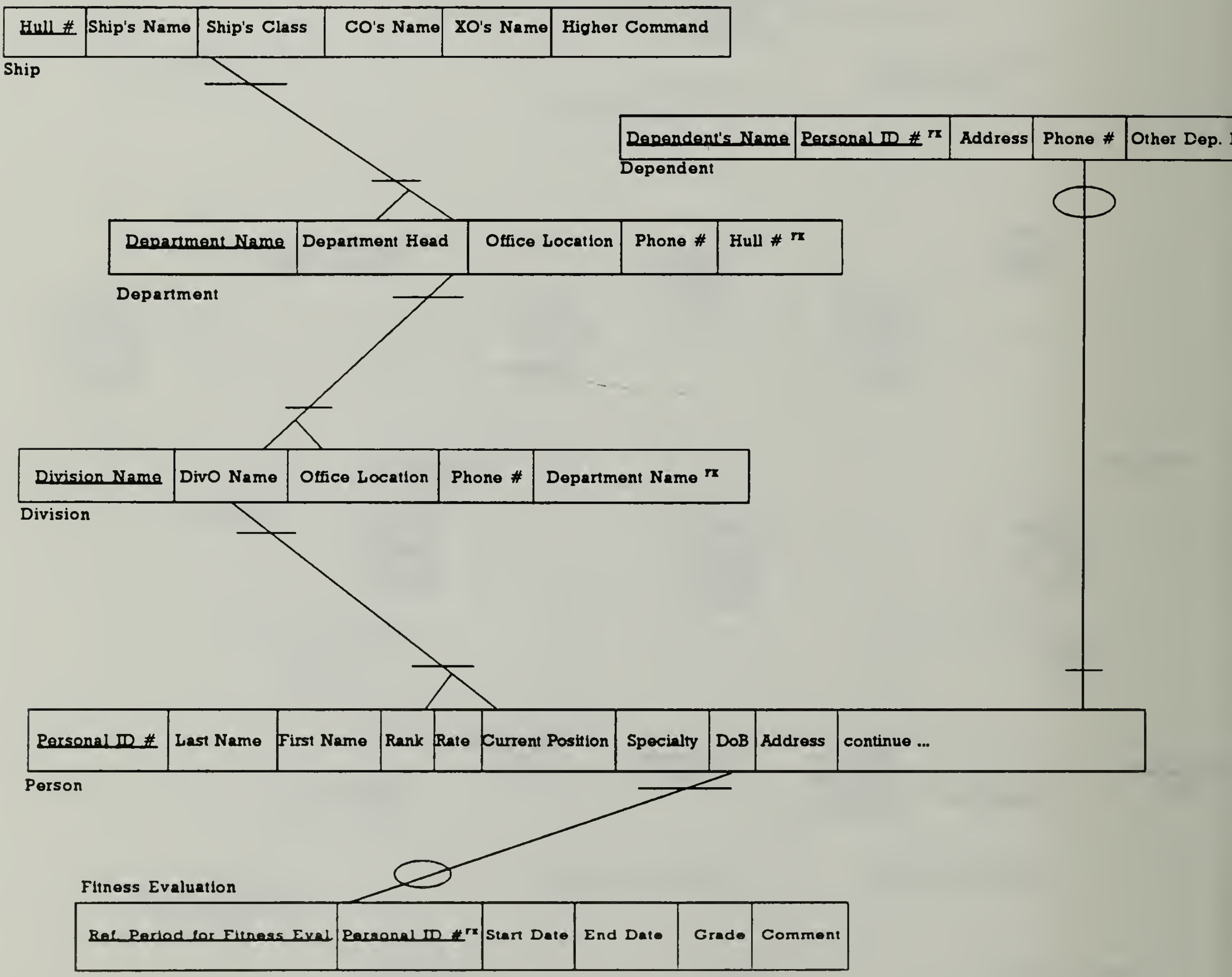
Project : B:\DFD\
Chart : lvl4p324
Filename : lvl4p324.dfd
Last modified on : Apr-27-1994
by User : Tsongas George

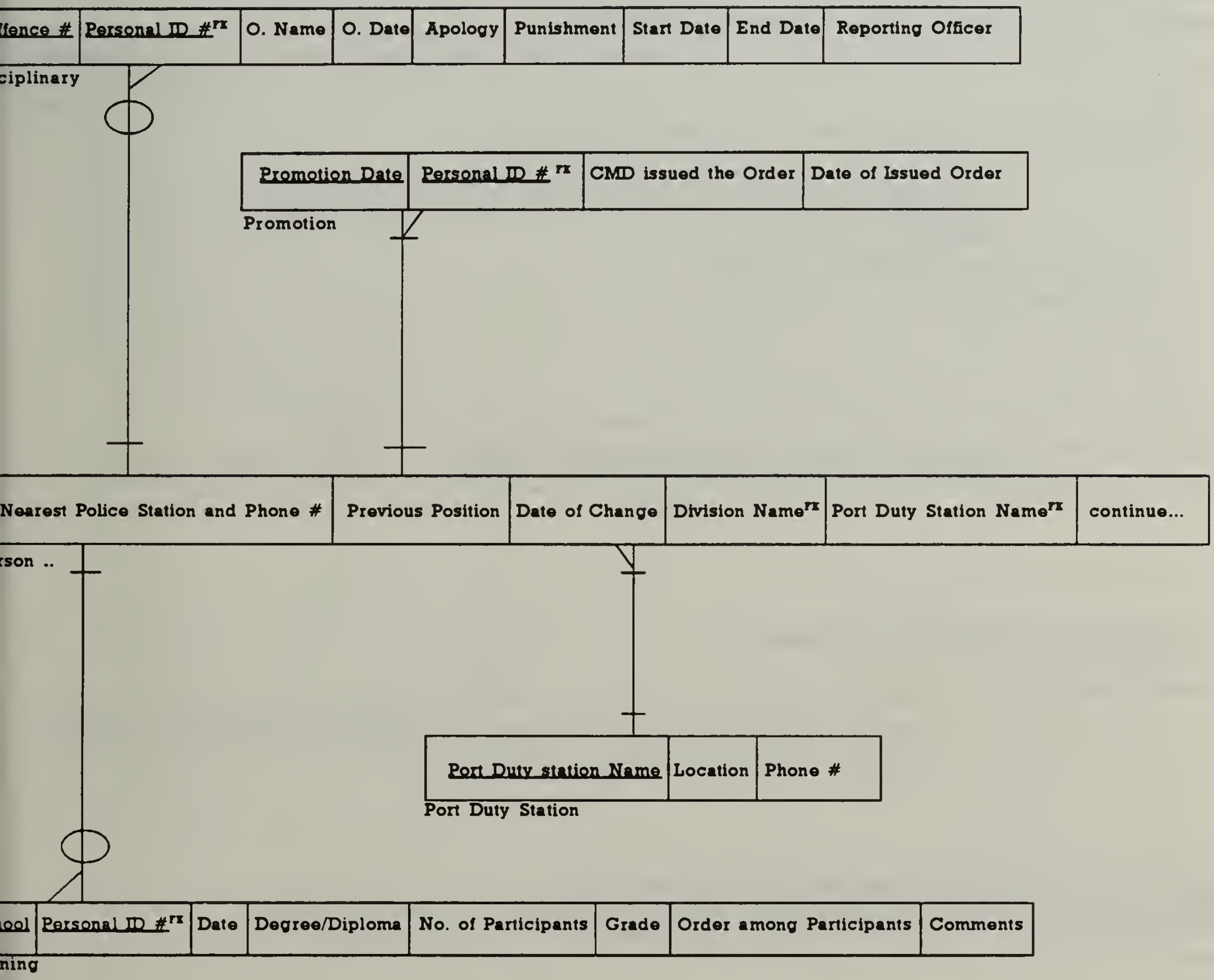

ADMINISTRATION OFFICE PERSONNEL
HALF CREW DIVISION SYSTEM REPORT
1/3 CREW DIVISION SYSTEM REPORT
XO DAILY DIVISION SYSTEM REPORT
3.2.4.1 P PRODUCE HALF CREW DIVISION SYSTEM REPORT
3.2.4.2 P PRODUCE 1/3 CREW DIVISION SYSTEM REPORT
3.2.4.3 P PRODUCE XO DAILY DIVISION SYSTEM REPORT
CREWMEMBER DATA
CREWMEMBER DATA
CREWMEMBER DATA
PERSON OBJECT
PERSON OBJECT
HALF CREW DIVISION SYSTEM INFORMATION
1/3 CREW DIVISION SYSTEM INFORMATION
XO DAILY DIVISION SYSTEM INFORMATION
CREW DIVISION OBJECT

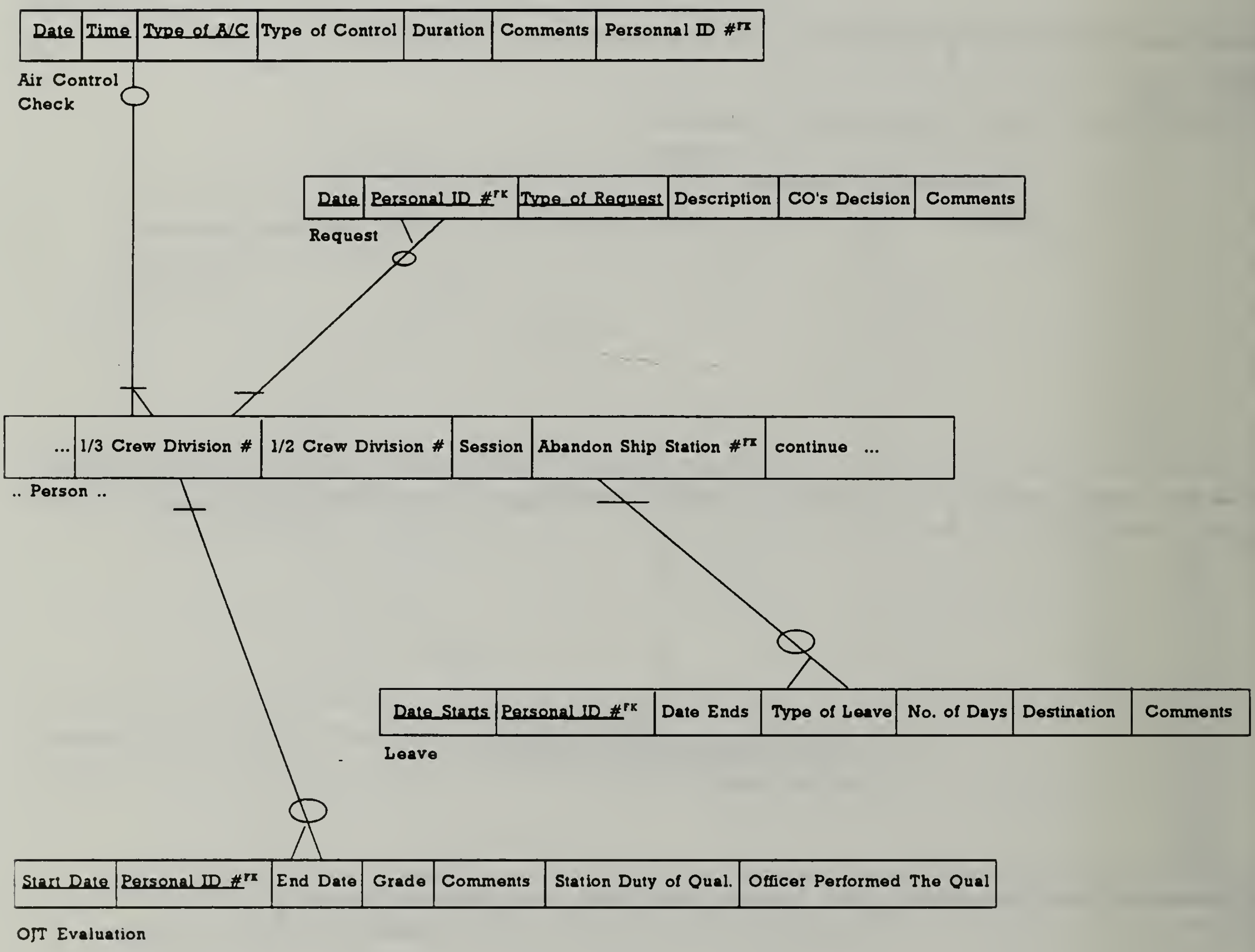
: B:\DFD\
lvl4p325
e : lvl4p325.dfd
dified on : Apr-27-1994
r : Tsongas George

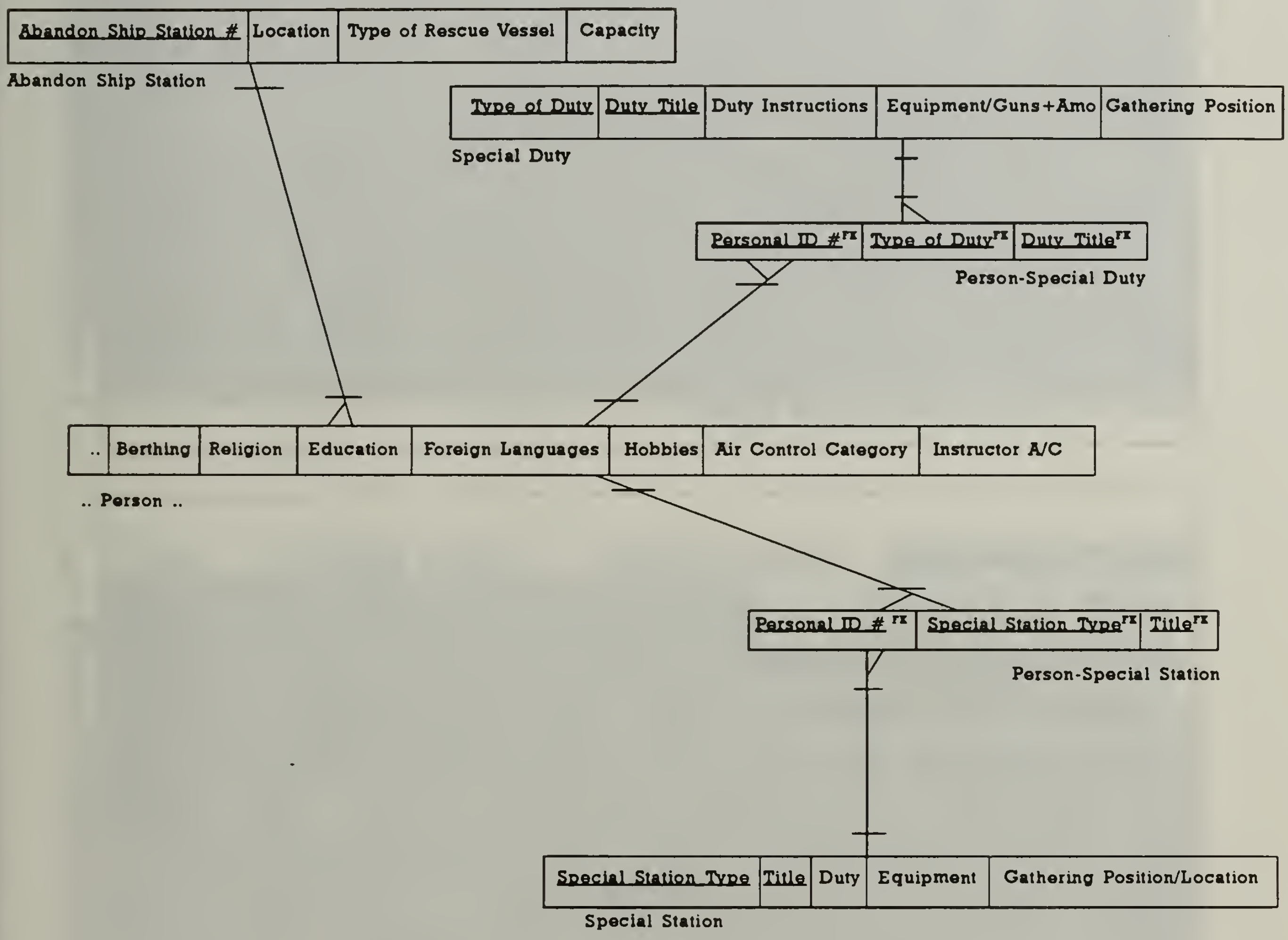

ADMINISTRATION OFFICE PERSONNEL
ALERT STATION REPORT
MOOR-TOW-ANCHORING STATION REPORT
ABANDON SHIP STATION REPORT
3.2.5.1 P PRODUCE ALERT STATION REPORT
3.2.5.2 P PRODUCE MOOR-TOW ANCHORING STATION REPORT
3.2.5.3 P PRODUCE ABANDON STATION REPORT
CREWMEMBER DATA
ALERT STATION INFORMATION
MOOR-TOW-ANCHORING STATION INFORMATION
CREWMEMBER DATA
CREWMEMBER DATA
ABANDON SHIP STATION INFO
SPECIAL STATION OBJECT
PERSON OBJECT
ABANDON SHIP STATION OBJECTS

APPENDIX D: RELATIONAL SCHEMA

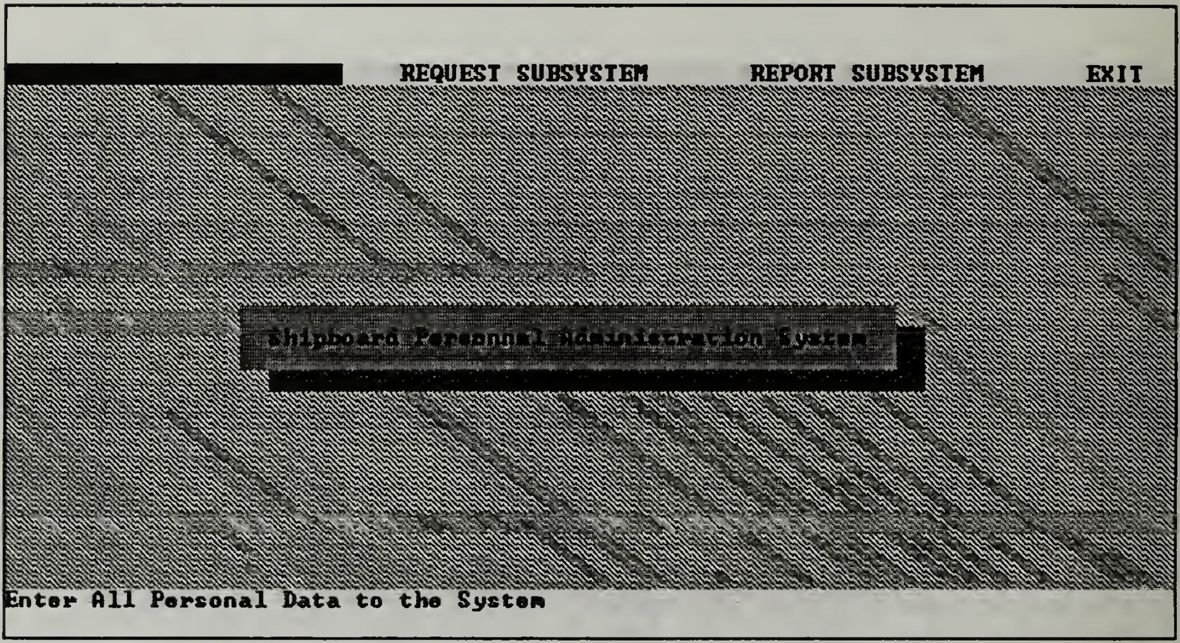

Hull #
Ship's Name
Ship's Class
CO's Name
XO's Name
Higher Command
Ship
Dependent's Name
Personal ID # FK
Address
Phone #
Other Dep.
Dependent
Department Name
Department Head
Office Location
Phone #
Hull # FK
Department
Division Name
DivO Name
Office Location
Phone #
Department Name FK
Division
Personal ID #
Last Name
First Name
Rank
Rate
Current Position
Specialty
DoB
Address
continue ...
Person
Fitness Evaluation
Ref. Period for Fitness Eval.
Personal ID # FK
Start Date
End Date
Grade
Comment


fence #
Personal ID #FK
O. Name
O. Date
Apology
Punishment
Start Date
End Date
Reporting Officer
ciplinary
Promotion Date
Personal ID # FK
CMD issued the Order
Date of Issued Order
Promotion
Nearest Police Station and Phone #
Previous Position
Date of Change
Division NameFK
Port Duty Station NameFK
continue...
son ..
Port Duty station Name
Location
Phone #
Port Duty Station
ool
Personal ID #FK
Date
Degree/Diploma
No. of Participants
Grade
Order among Participants
Comments
ning

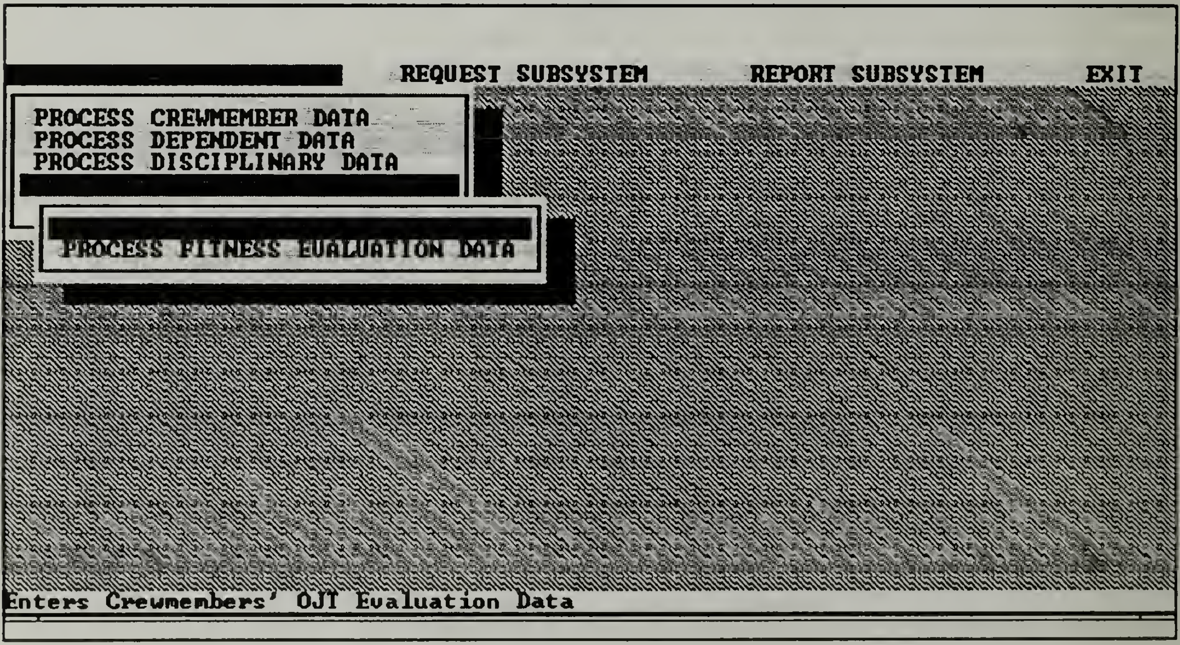

Date
Time
Type of A/C
Type of Control
Duration
Comments
Personnal ID #FK
Air Control Check
Date
Personal ID #FK
Type of Request
Description
CO's Decision
Comments
Request
... 1/3 Crew Division #
1/2 Crew Division #
Session
Abandon Ship Station #FK
continue ...
.. Person ..
Date Starts
Personal ID #FK
Date Ends
Type of Leave
No. of Days
Destination
Comments
Leave
Start Date
Personal ID #FK
End Date
Grade
Comments
Station Duty of Qual.
Officer Performed The Qual
OJT Evaluation


Abandon Ship Station # | Location | Type of Rescue Vessel | Capacity
Abandon Ship Station
Type of Duty | Duty Title | Duty Instructions | Equipment/Guns+Amo | Gathering Position
Special Duty
Personal ID #FK | Type of DutyFK | Duty TitleFK
Person-Special Duty
.. | Berthing | Religion | Education | Foreign Languages | Hobbies | Air Control Category | Instructor A/C
.. Person ..
Personal ID # FK | Special Station TypeFK | TitleFK
Person-Special Station
Special Station Type | Title | Duty | Equipment | Gathering Position/Location
Special Station

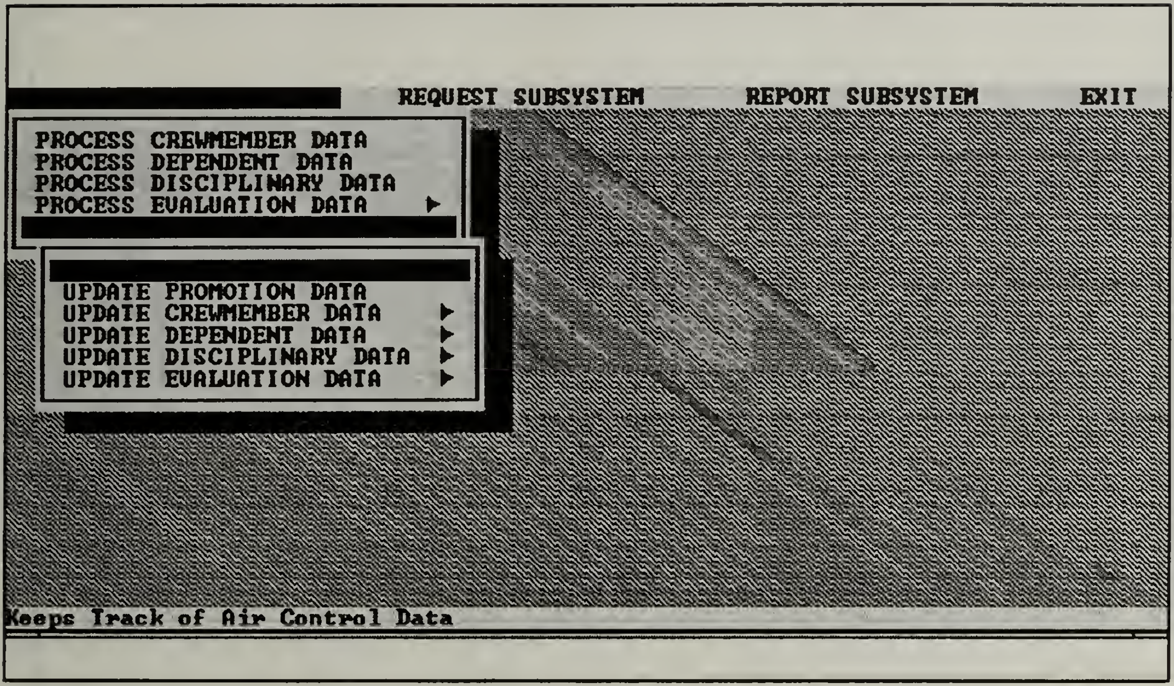
APPENDIX E: APPLICATION MENUS


REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
Shipboard Personnel Administration System

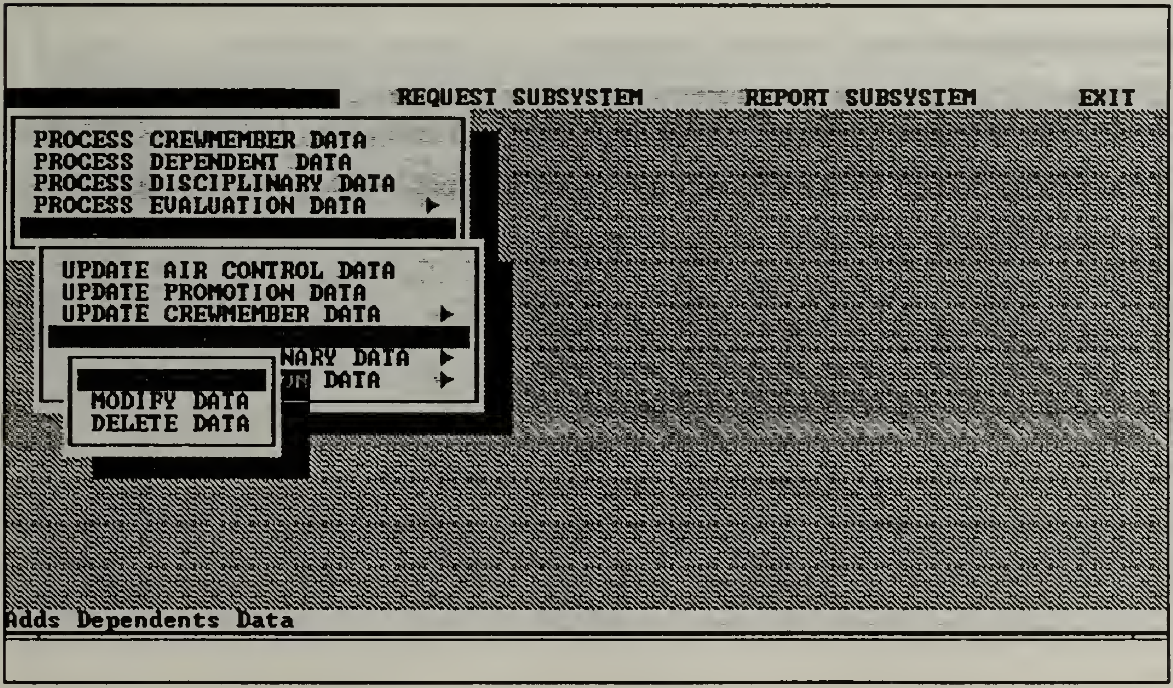
Enter All Personal Data to the System


REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
PROCESS CREWMEMBER DATA
PROCESS DEPENDENT DATA
PROCESS DISCIPLINARY DATA
PROCESS FITNESS EVALUATION DATA

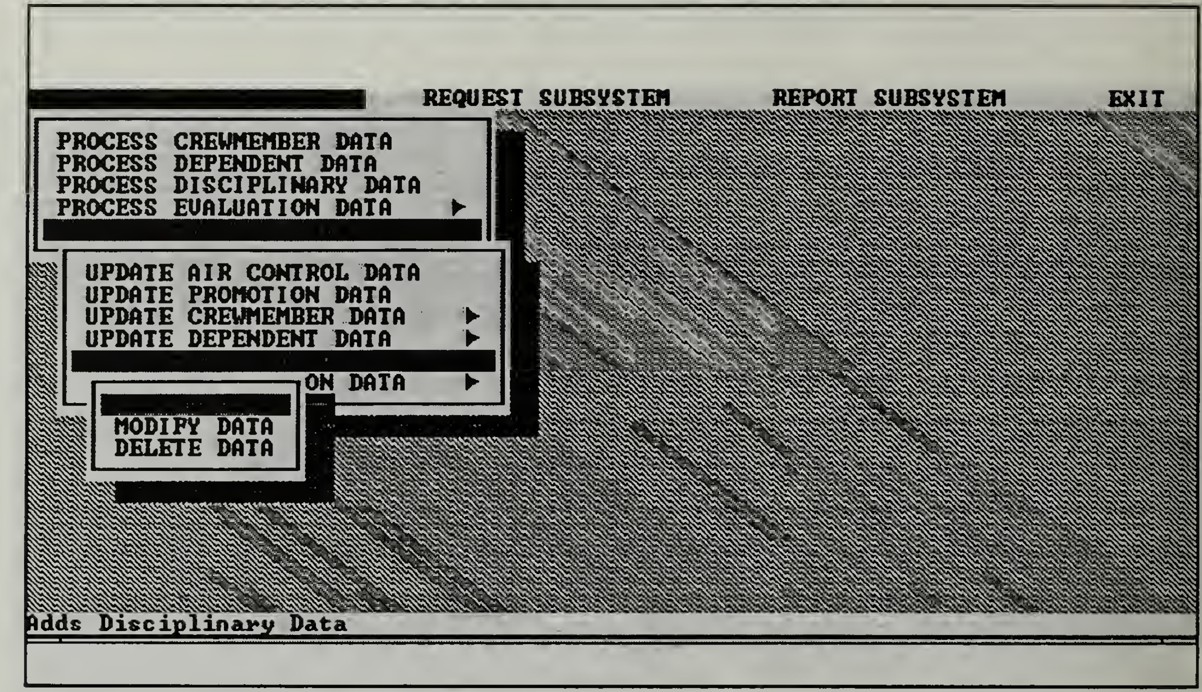
Enters Crewmembers' OJT Evaluation Data


REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
PROCESS CREWMEMBER DATA
PROCESS DEPENDENT DATA
PROCESS DISCIPLINARY DATA
PROCESS EVALUATION DATA ▸
UPDATE PROMOTION DATA
UPDATE CREWMEMBER DATA ▸
UPDATE DEPENDENT DATA ▸
UPDATE DISCIPLINARY DATA ▸
UPDATE EVALUATION DATA ▸

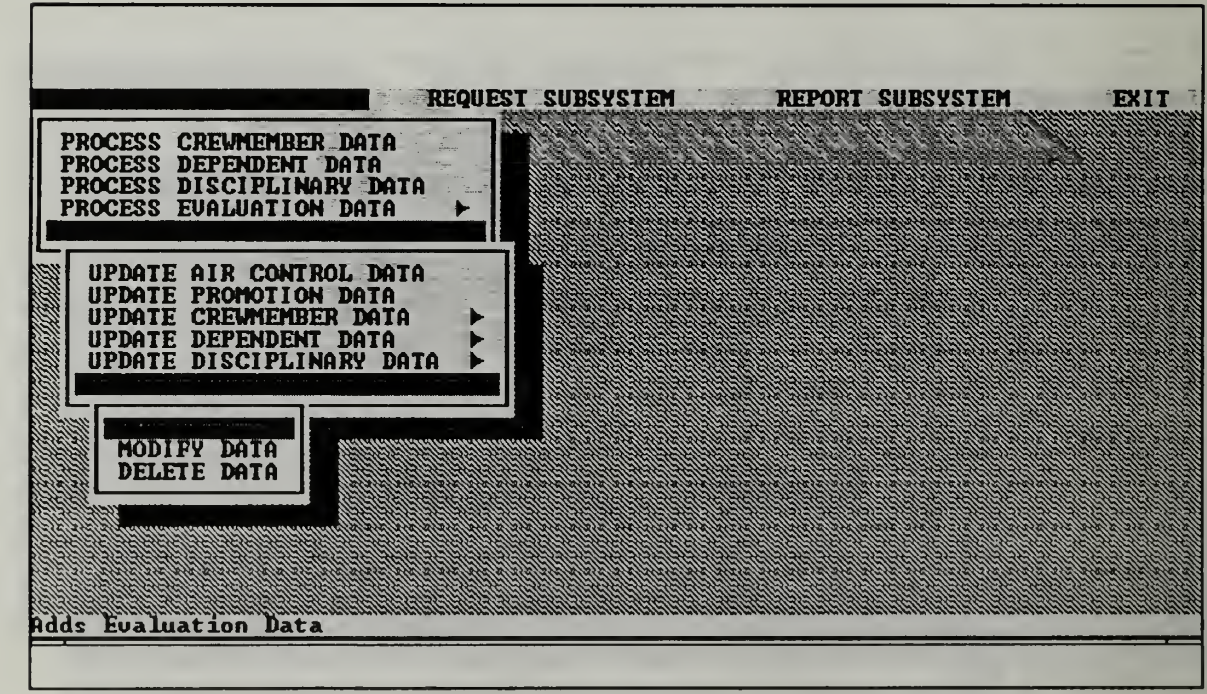
Keeps Track of Air Control Data


REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
PROCESS CREWMEMBER DATA
PROCESS DEPENDENT DATA
PROCESS DISCIPLINARY DATA
PROCESS EVALUATION DATA ▸
UPDATE AIR CONTROL DATA
UPDATE PROMOTION DATA
UPDATE CREWMEMBER DATA ▸
NARY DATA ▸
DATA ▸
MODIFY DATA
DELETE DATA

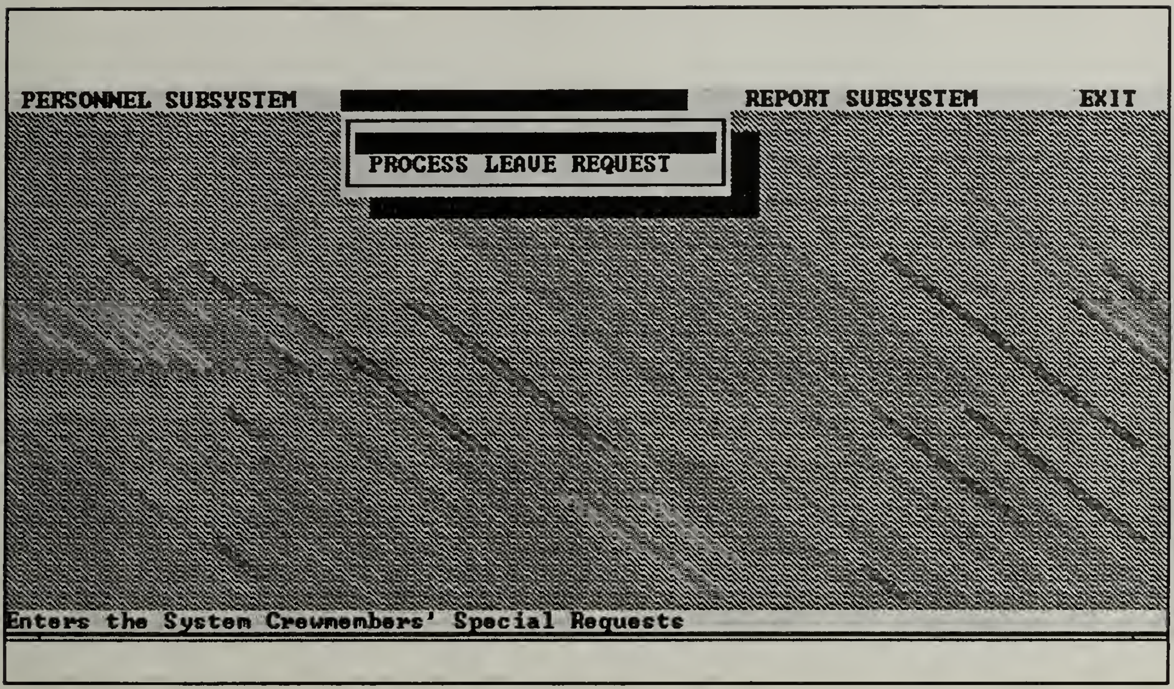
Adds Dependents Data


REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
PROCESS CREWMEMBER DATA
PROCESS DEPENDENT DATA
PROCESS DISCIPLINARY DATA
PROCESS EVALUATION DATA ▶
UPDATE AIR CONTROL DATA
UPDATE PROMOTION DATA
UPDATE CREWMEMBER DATA ▶
UPDATE DEPENDENT DATA ▶
ON DATA ▶
MODIFY DATA
DELETE DATA

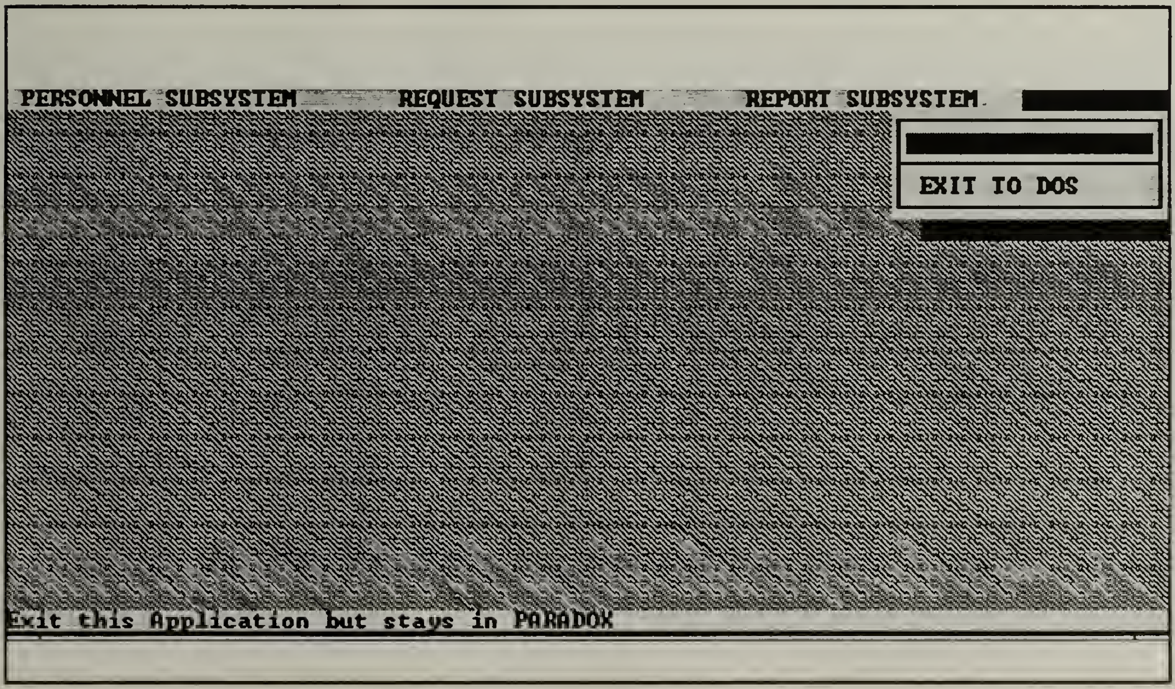
Adds Disciplinary Data


REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
PROCESS CREWMEMBER DATA
PROCESS DEPENDENT DATA
PROCESS DISCIPLINARY DATA
PROCESS EVALUATION DATA ▶
UPDATE AIR CONTROL DATA
UPDATE PROMOTION DATA
UPDATE CREWMEMBER DATA ▶
UPDATE DEPENDENT DATA ▶
UPDATE DISCIPLINARY DATA ▶
MODIFY DATA
DELETE DATA

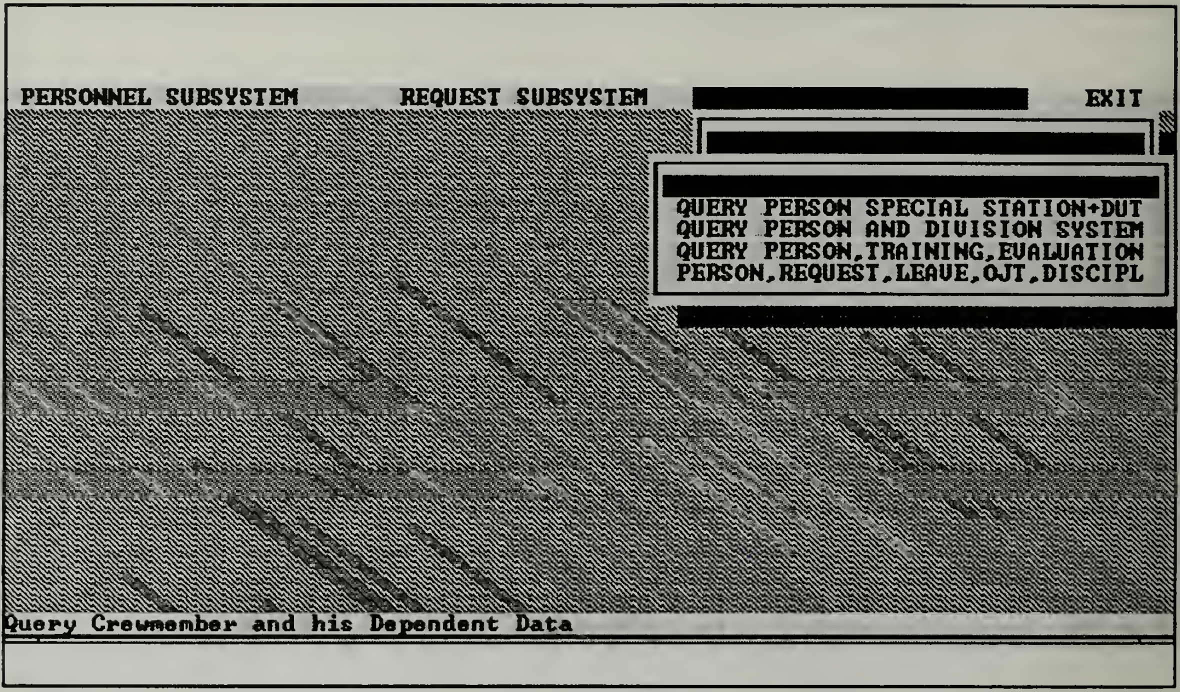
Adds Evaluation Data


PERSONNEL SUBSYSTEM
REPORT SUBSYSTEM
EXIT
PROCESS LEAVE REQUEST

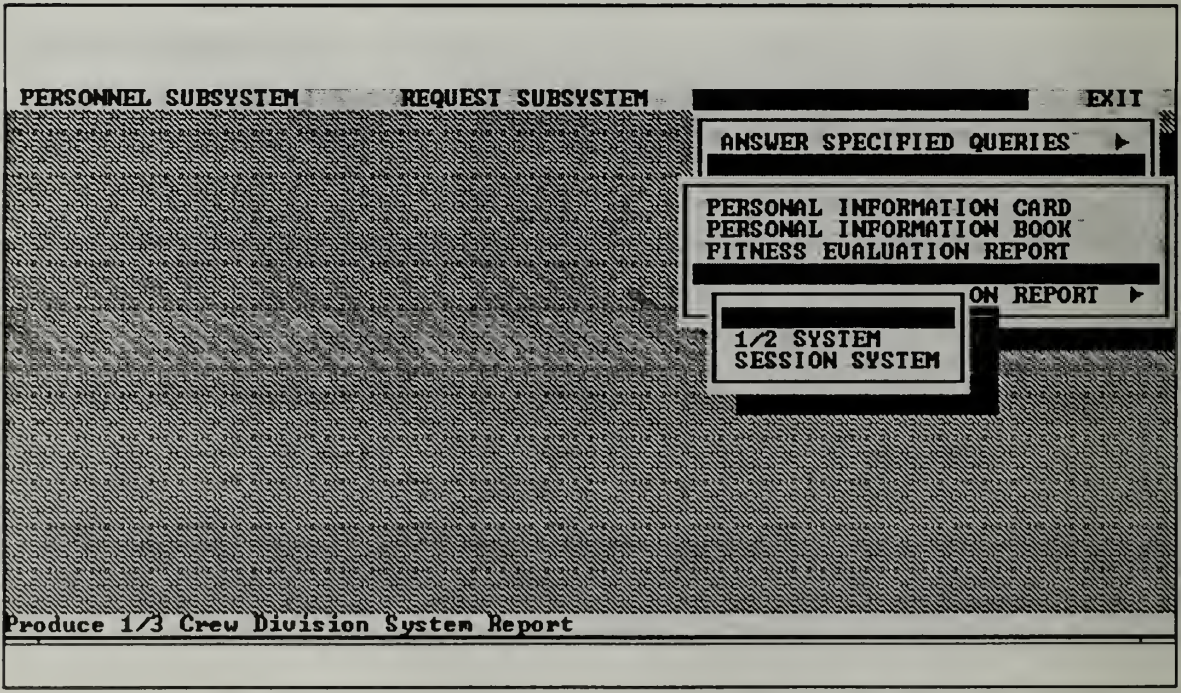
Enters the System Crewmembers' Special Requests


PERSONNEL SUBSYSTEM
REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT TO DOS

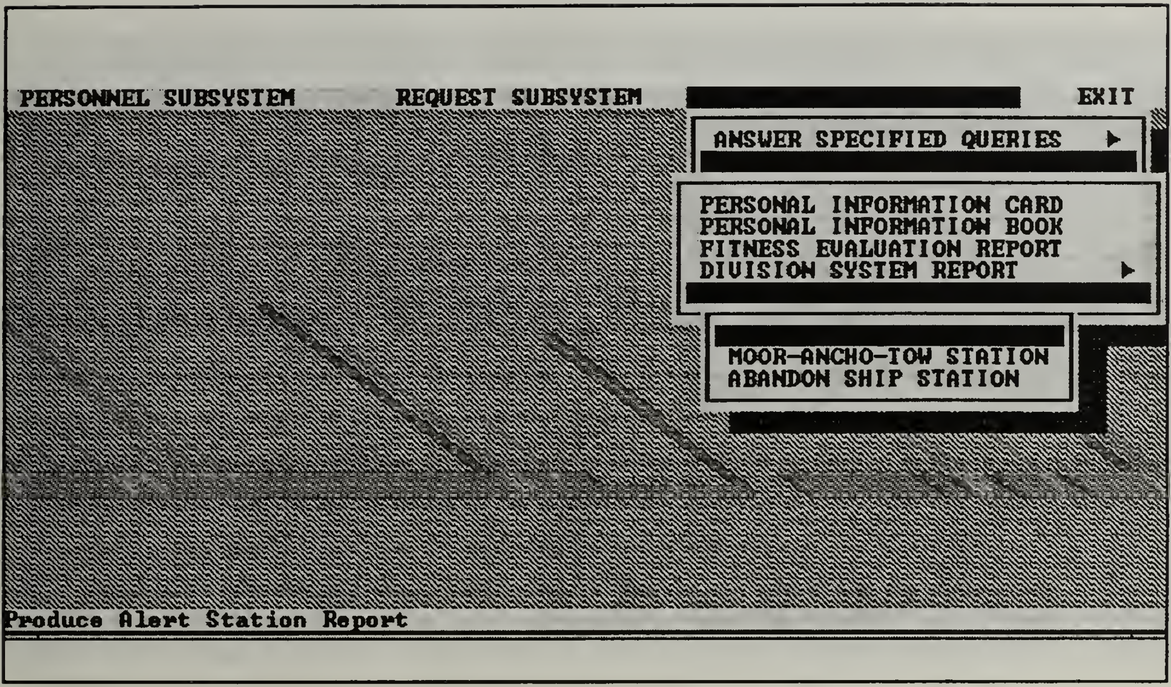
Exit this Application but stays in PARADOX


PERSONNEL SUBSYSTEM
REQUEST SUBSYSTEM
EXIT
QUERY PERSON SPECIAL STATION+DUT
QUERY PERSON AND DIVISION SYSTEM
QUERY PERSON,TRAINING,EVALUATION
PERSON,REQUEST,LEAVE,OJT,DISCIPL

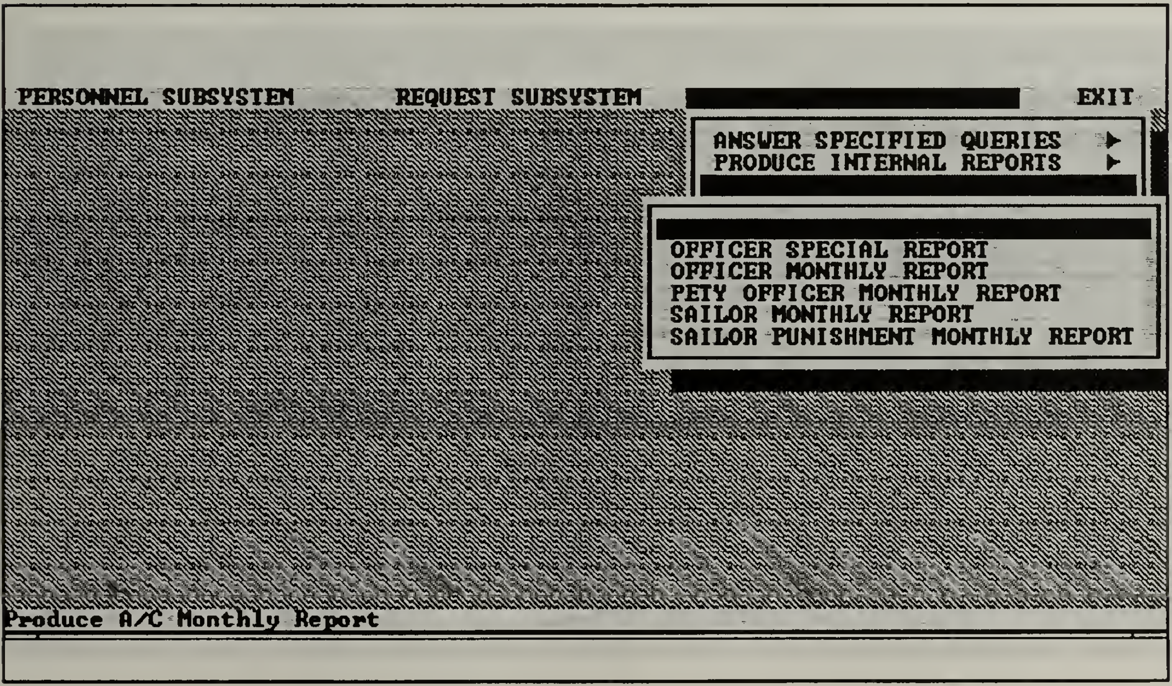
Query Crewmember and his Dependent Data


PERSONNEL SUBSYSTEM
REQUEST SUBSYSTEM
EXIT
ANSWER SPECIFIED QUERIES ▶
PERSONAL INFORMATION CARD
PERSONAL INFORMATION BOOK
FITNESS EVALUATION REPORT
ON REPORT ▶
1/2 SYSTEM
SESSION SYSTEM

Produce 1/3 Crew Division System Report

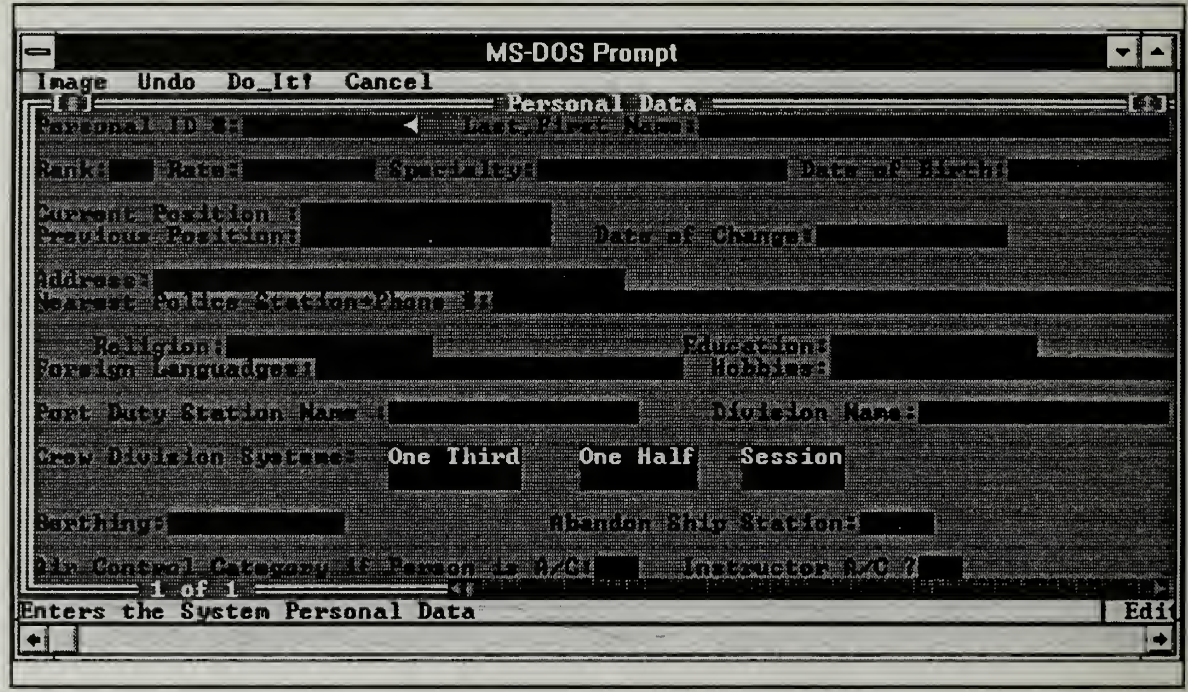

PERSONNEL SUBSYSTEM
REQUEST SUBSYSTEM
EXIT
ANSWER SPECIFIED QUERIES ▶
PERSONAL INFORMATION CARD
PERSONAL INFORMATION BOOK
FITNESS EVALUATION REPORT
DIVISION SYSTEM REPORT ▶
MOOR-ANCHO-TOW STATION
ABANDON SHIP STATION

Produce Alert Station Report


PERSONNEL SUBSYSTEM
REQUEST SUBSYSTEM
EXIT
ANSWER SPECIFIED QUERIES ▶
PRODUCE INTERNAL REPORTS ▶
OFFICER SPECIAL REPORT
OFFICER MONTHLY REPORT
PETY OFFICER MONTHLY REPORT
SAILOR MONTHLY REPORT
SAILOR PUNISHMENT MONTHLY REPORT

Produce A/C Monthly Report

APPENDIX F: APPLICATION INPUT FORMS


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
1 of 1
Edit

Personal Data

Personal ID #: Last,First Name:

Rank: Rate: Specialty: Date of Birth:

Current Position :
Previous Position: Date of Change:

Address:
Nearest Police Station-Phone #:

Religion: Education:
Foreign Languadges: Hobbies:

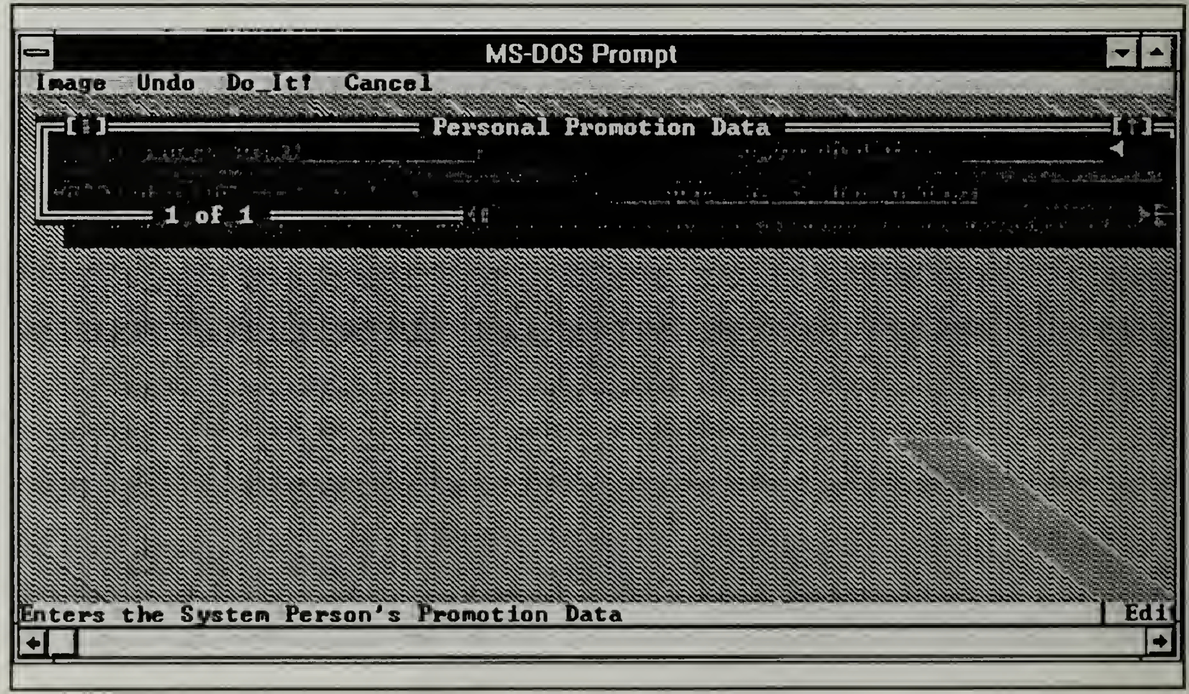
Port Duty Station Name : Division Name:

Crew Division Systems: One Third One Half Session

Berthing: Abandon Ship Station:

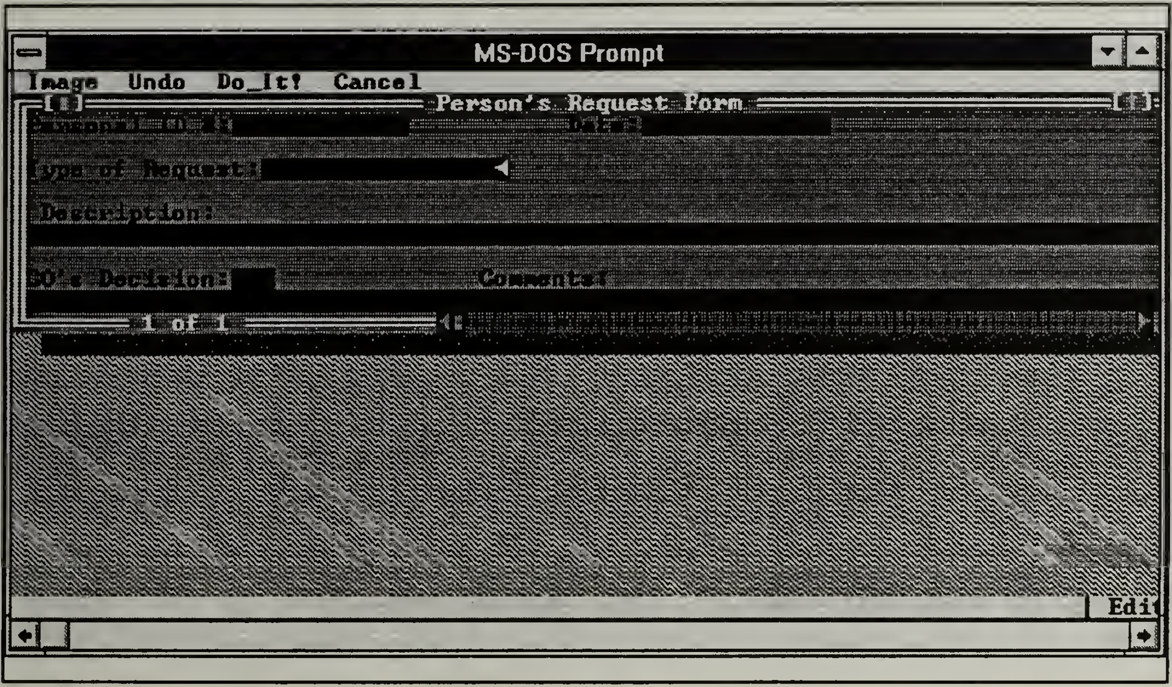
Air Control Category if Person is A/C: Instructor A/C ?

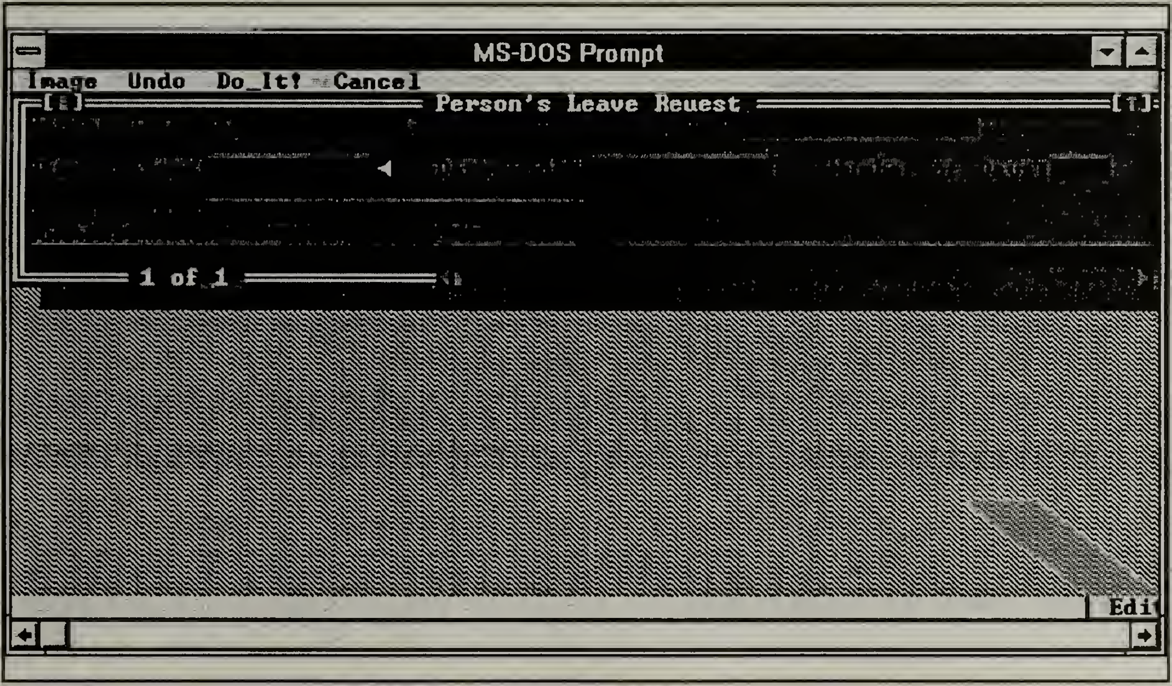
Enters the System Personal Data

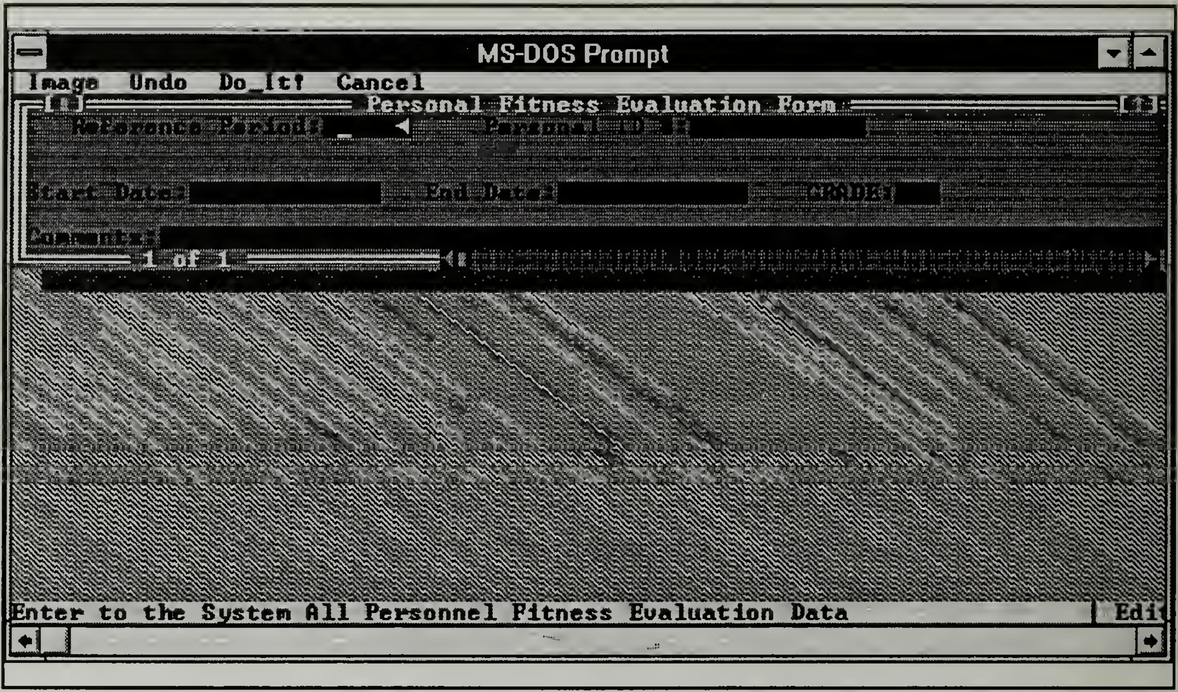

MS-DOS Prompt
Image
Undo
Do_It!
Cancel
1 of 1
Edit

Personal Promotion Data

Enters the System Person's Promotion Data


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Person's Request Form
Date:
Type of Request:
Description:
DO's Decision:
Comments:
1 of 1
Edit


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Person's Leave Reuest
1 of 1
Edit


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Edit

Personal Fitness Evaluation Form

Reference Period: _

Personnel ID:

Start Date:

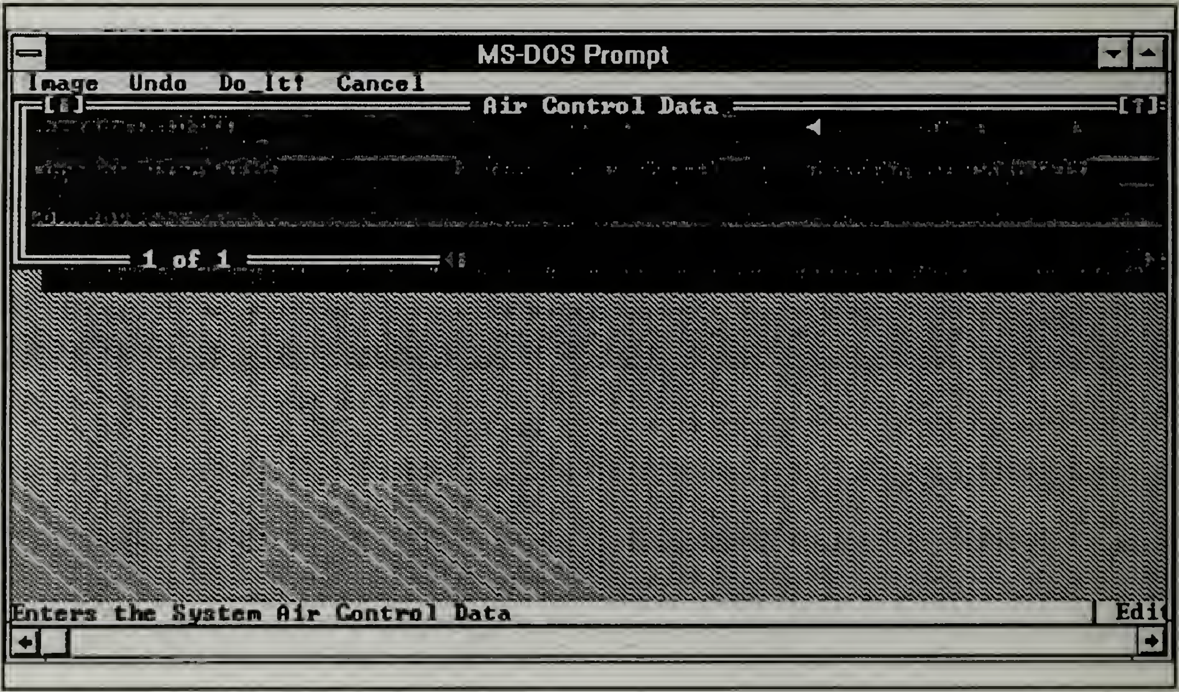
End Date:

GRADE:

Comments:

1 of 1

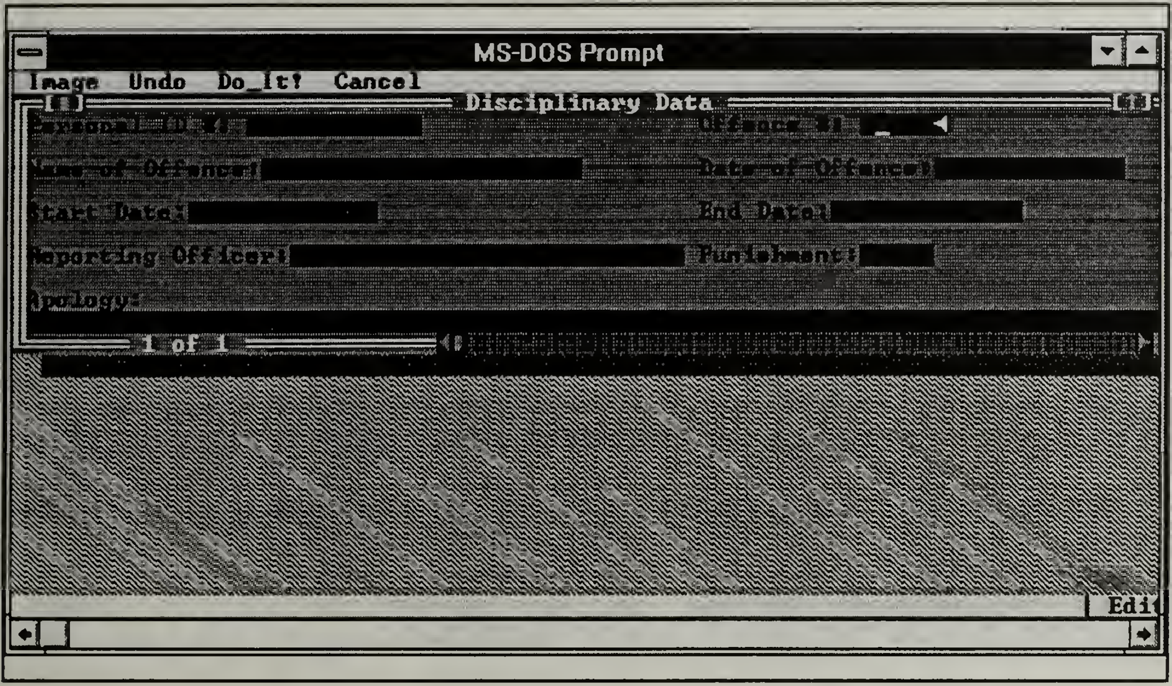
Enter to the System All Personnel Fitness Evaluation Data


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Edit

Air Control Data

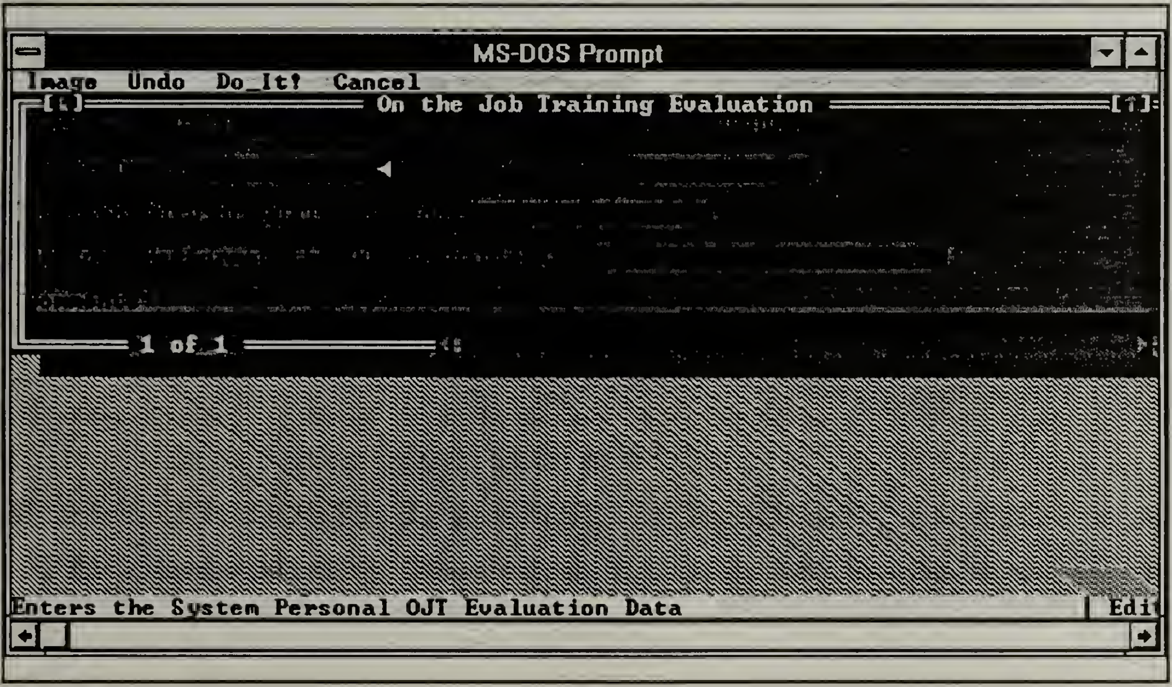
1 of 1

Enters the System Air Control Data


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
[■]
[↑]
1 of 1
Edi

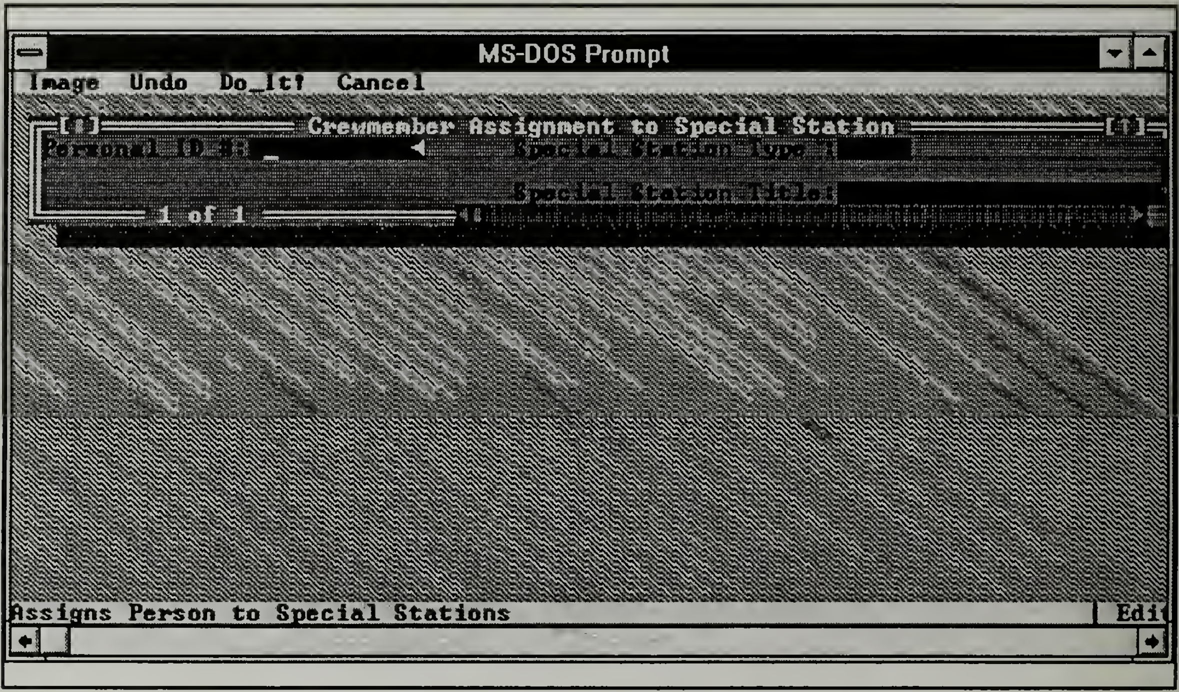
Disciplinary Data

Personal ID #:
Offence #:
Name of Offence:
Date of Offence:
Start Date:
End Date:
Reporting Officer:
Punishment:
Apology:


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
[■]
[↑]
1 of 1
Edi

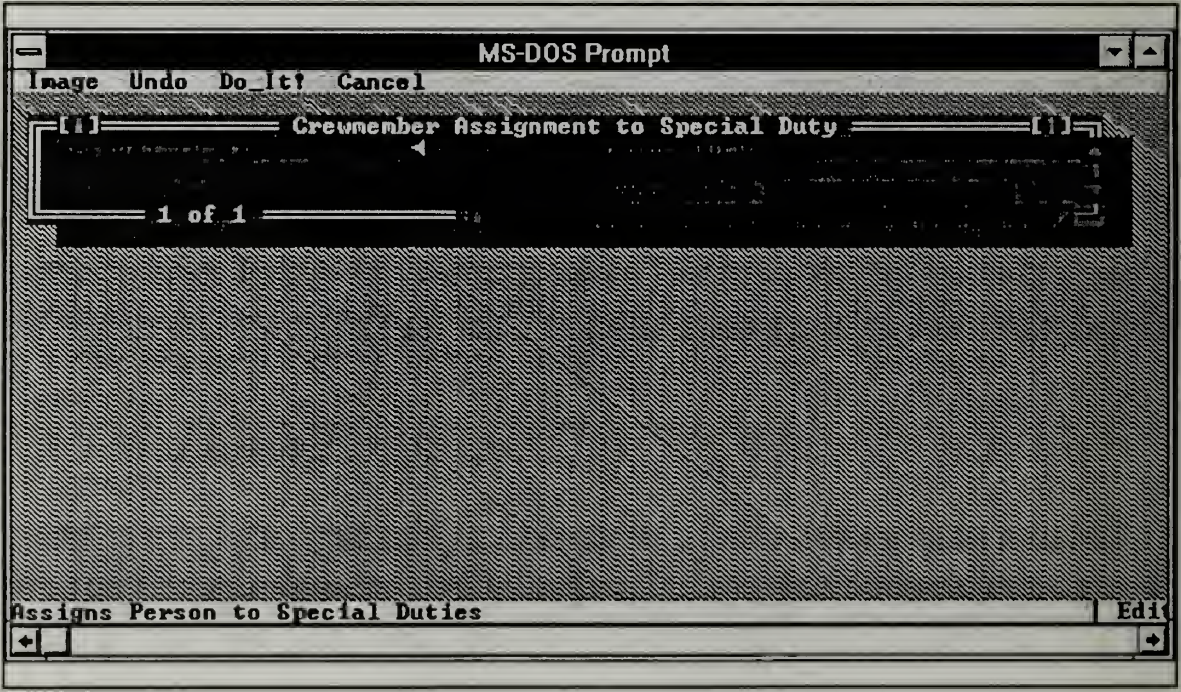
On the Job Training Evaluation

Enters the System Personal OJT Evaluation Data


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Personal ID #:
Special Station Type :
Special Station Title:
1 of 1
Edi

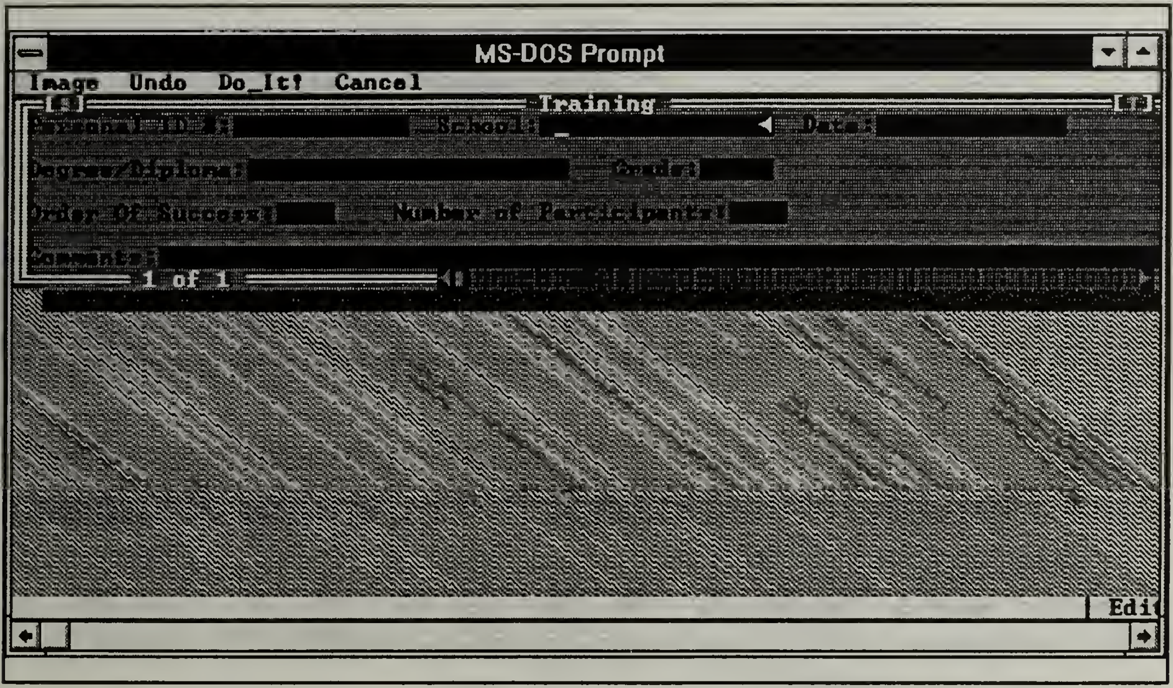
Crewmember Assignment to Special Station

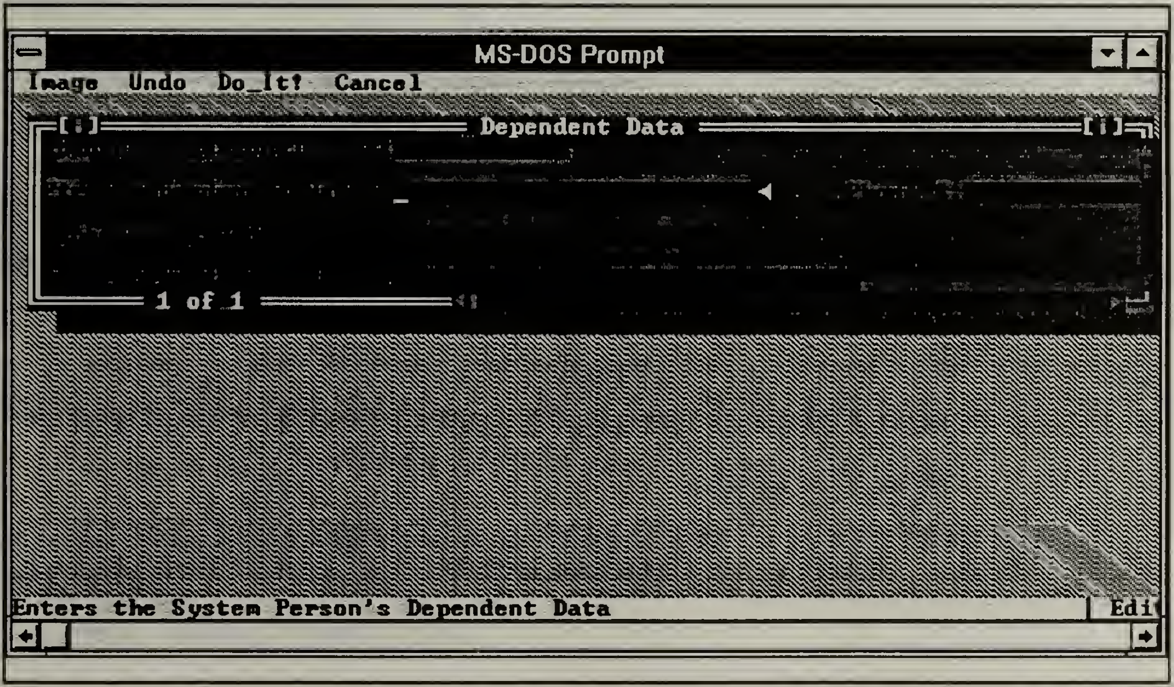
Assigns Person to Special Stations


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
1 of 1
Edi

Crewmember Assignment to Special Duty

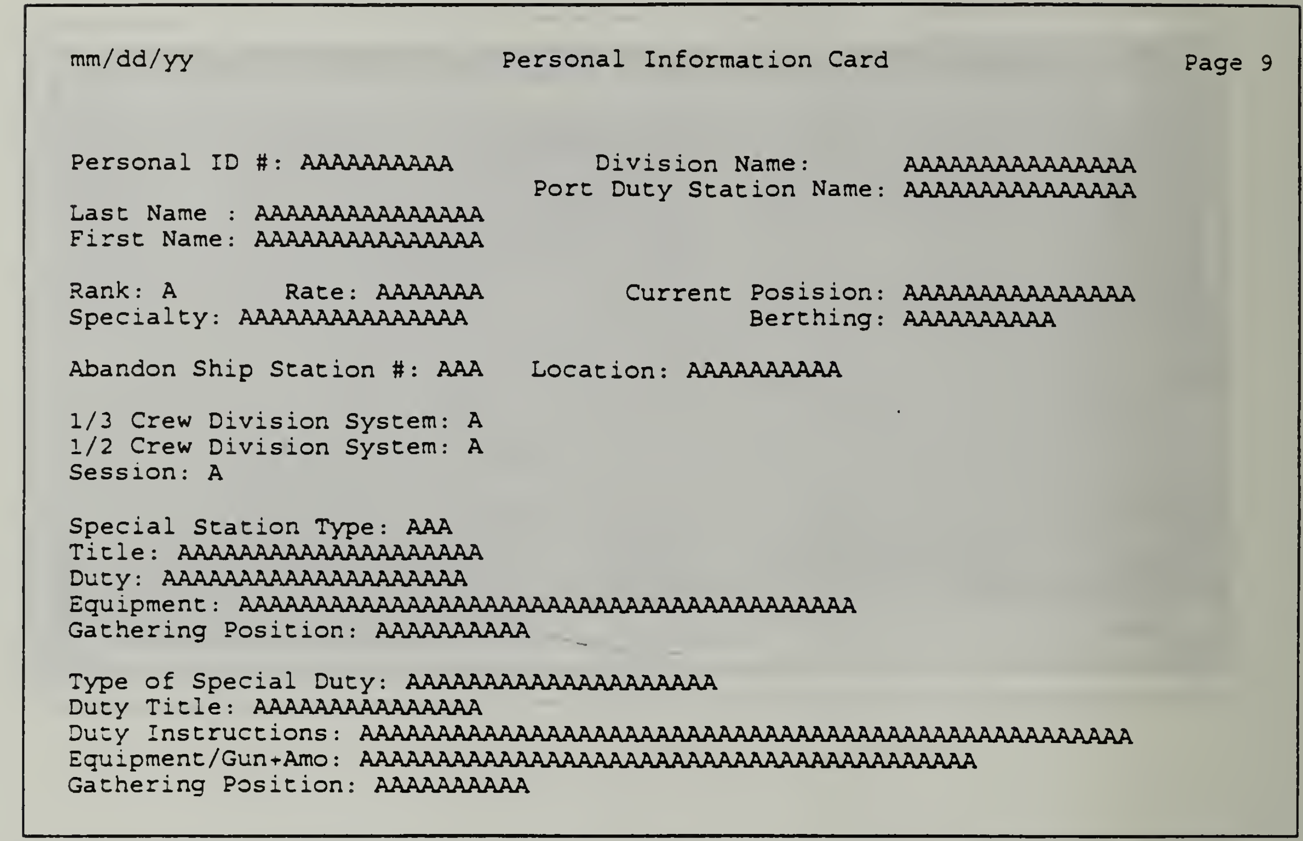
Assigns Person to Special Duties


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Training
Personal ID #:
School:
Date:
Degree/Diploma:
Grade:
Order Of Success:
Number of Participants:
Comments:
1 of 1
Edit


MS-DOS Prompt
Image
Undo
Do_It!
Cancel
Dependent Data
1 of 1
Edit

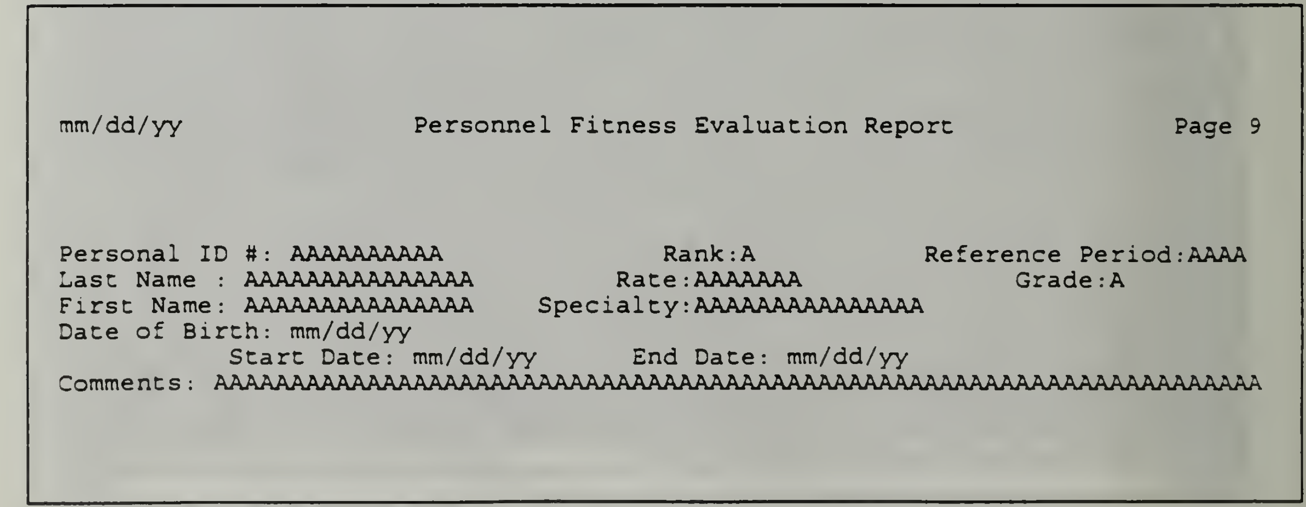
Enters the System Person's Dependent Data

APPENDIX G: APPLICATION REPORTS



```
mm/dd/yy                    Personal Information Card                   Page 9


Personal ID #: AAAAAAAAAA         Division Name:      AAAAAAAAAAAAAAA
                              Port Duty Station Name: AAAAAAAAAAAAAAA
Last Name : AAAAAAAAAAAAAAA
First Name: AAAAAAAAAAAAAAA

Rank: A       Rate: AAAAAAA         Current Posision: AAAAAAAAAAAAAAA
Specialty: AAAAAAAAAAAAAAA                  Berthing: AAAAAAAAAA

Abandon Ship Station #: AAA   Location: AAAAAAAAAA

1/3 Crew Division System: A
1/2 Crew Division System: A
Session: A

Special Station Type: AAA
Title: AAAAAAAAAAAAAAAAAAAA
Duty: AAAAAAAAAAAAAAAAAAAA
Equipment: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Gathering Position: AAAAAAAAAA

Type of Special Duty: AAAAAAAAAAAAAAAAAAAA
Duty Title: AAAAAAAAAAAAAAA
Duty Instructions: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Equipment/Gun+Amo: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Gathering Position: AAAAAAAAAA
```

Personal Information Card Format



```
mm/dd/yy               Personnel Fitness Evaluation Report              Page 9


Personal ID #: AAAAAAAAAA              Rank:A           Reference Period:AAAA
Last Name : AAAAAAAAAAAAAAA         Rate:AAAAAAA              Grade:A
First Name: AAAAAAAAAAAAAAA    Specialty:AAAAAAAAAAAAAAA
Date of Birth: mm/dd/yy
           Start Date: mm/dd/yy      End Date: mm/dd/yy
Comments: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

Fitness Evaluation Report Forrmat

```
mm/dd/yy                   Officer's Special Report                    Page 9



Personal ID  Last / First Name   Rate          Address
AAAAAAAAAA    AAAAAAAAAAAAAAA   AAAAAAA   AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
              AAAAAAAAAAAAAAA   Rank: A
             Specialty: AAAAAAAAAAAAAAA
                   Nearest Police station & phone Nr.:
          AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

Officer's Special Report Format

```
mm/dd/yy                      Officers' Monthly Report                        Page 9



Person ID  Rank Rate        Last Name       Current Pos.             Address
AAAAAAAAAA  A  AAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAA
                          First Name       Previous Pos.
           Specialty   AAAAAAAAAAAAAAA AAAAAAAAAAAAAAA
          AAAAAAAAAAAAA                     Date of Change
                                              mm/dd/yy
```

Officer's Monthly Report Format

```
mm/dd/yy                    Petty Officers' Monthly Report                    Page 9



  Last Name     Rank Rate    Person ID   Current Pos.            Address
AAAAAAAAAAAAAAA A  AAAAAAA AAAAAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAA
  First Name                              Specialty       Near Police Station
AAAAAAAAAAAAAAA                        AAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAA
```

Petty Officer's Monthly Report Format

```
mm/dd/yy                    1/2 Crew Division System                   Page 9


Division Person ID     Last Name       First Name    Rank Rate       Specialty
-------- ---------- --------------- -------------- ---- ------- --------------
   A     AAAAAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAA   A  AAAAAAA AAAAAAAAAAAAAA
```

1/2 Crew Division System Report Format

```
mm/dd/yy                    1/ 3 Crew Division System                  Page 9


Division Person ID     Last Name       First Name    Rank Rate       Specialty
-------- ---------- --------------- -------------- ---- ------- --------------
   A     AAAAAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAA   A  AAAAAAA AAAAAAAAAAAAAA
```

1/3 Crew Division System Report Format

```
mm/dd/yy              XO's Daily Division System Report                Page 9


Session Person ID     Last Name       First Name    Rank Rate       Specialty
------- ---------- --------------- -------------- ---- ------- --------------
   A    AAAAAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAA   A  AAAAAAA AAAAAAAAAAAAAA
```

XO Daily Session Division System Report Format

```
mm/dd/yy                         Alert Station Report                         Page 9


Last/First Name     Rank   Rate        Div.:           Title
                      A   AAAAAAA      1/3:A   AAAAAAAAAAAAAAAAAAAA       Location
AAAAAAAAAAAAAAA      Specialty         1/2:A           Duty               AAAAAAAAAA
AAAAAAAAAAAAAAA   AAAAAAAAAAAAAAA              AAAAAAAAAAAAAAAAAAAA
      Berthing:   AAAAAAAAAA
```

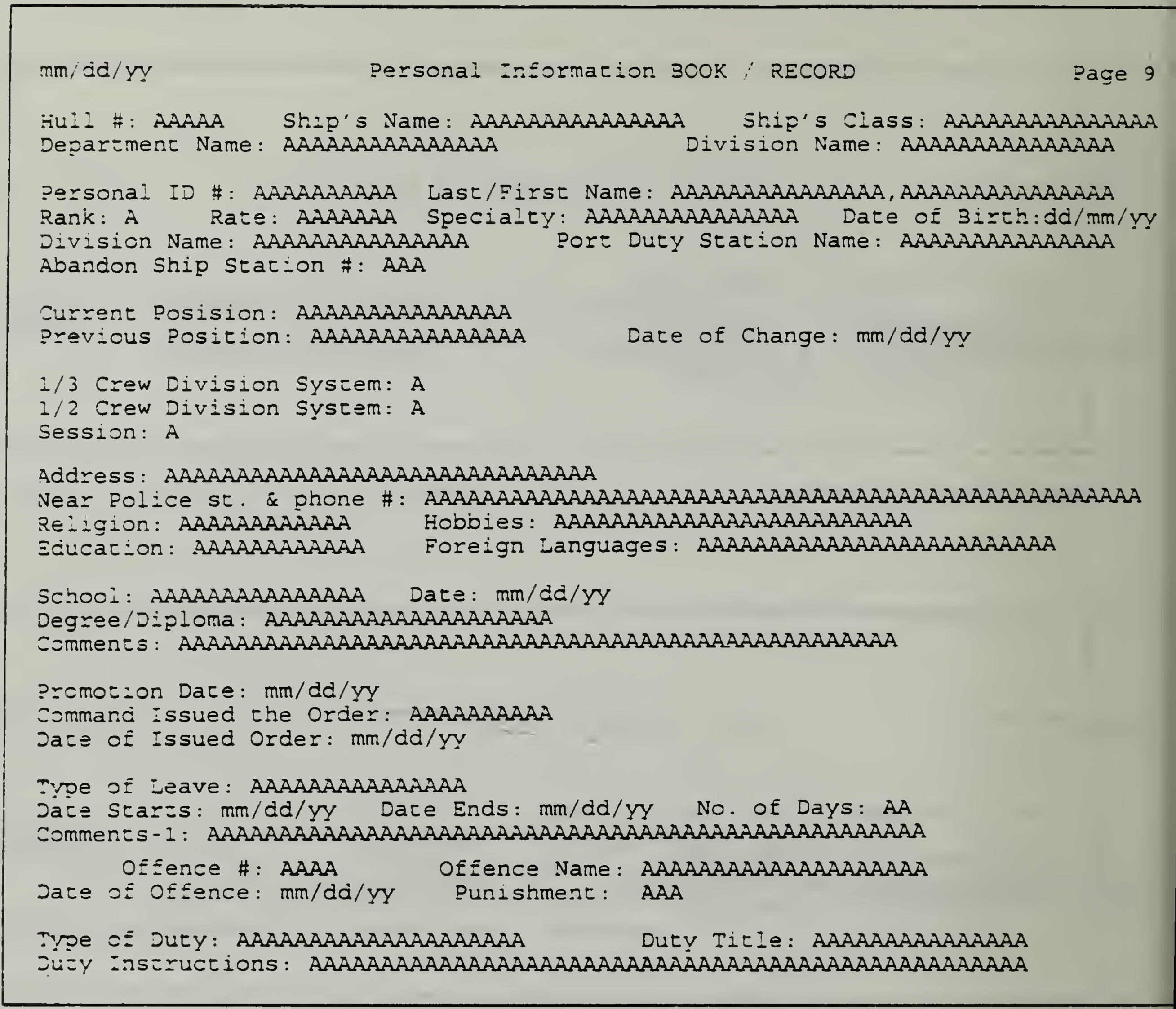
Alert Station Report Format

```
mm/dd/yy                        Special Station Report                        Page 9


Last/First Name     Rank  Rate       Div.:        Title
                      A   AAAAAAA    1/3:A AAAAAAAAAAAAAAAAAAAA             Location
AAAAAAAAAAAAAAA      Specialty       1/2:A      Duty                       AAAAAAAAAA
AAAAAAAAAAAAAAA AAAAAAAAAAAAAAA            AAAAAAAAAAAAAAAAAAAA
      Berthing: AAAAAAAAAA
                               Equipment: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

Special Station Report Format

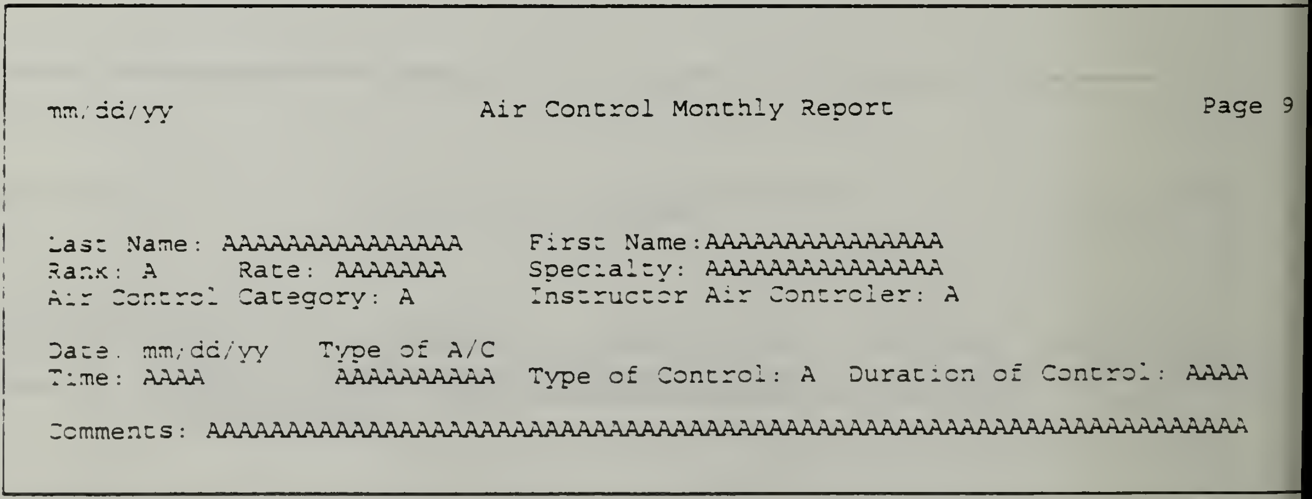
```
mm/dd/yy                        Abandon Ship Stations                          Page 9


Station #  Location      Rescue Vessel       Cap/ty Last/First Name Rank   Rate
--------- ---------- -------------------- ------ --------------- ----  -------
  AAA     AAAAAAAAAA AAAAAAAAAAAAAAAAAAAA 999999 AAAAAAAAAAAAAAA   A   AAAAAAA
                                                 AAAAAAAAAAAAAAA
```

Abandon Ship Station Report Format



```
mm/dd/yy                Personal Information BOOK / RECORD                   Page 9

Hull #: AAAAA    Ship's Name: AAAAAAAAAAAAAAA    Ship's Class: AAAAAAAAAAAAAAA
Department Name: AAAAAAAAAAAAAAA                Division Name: AAAAAAAAAAAAAAA

Personal ID #: AAAAAAAAAA  Last/First Name: AAAAAAAAAAAAAAA,AAAAAAAAAAAAAAA
Rank: A     Rate: AAAAAAA  Specialty: AAAAAAAAAAAAAAA   Date of Birth:dd/mm/yy
Division Name: AAAAAAAAAAAAAAA       Port Duty Station Name: AAAAAAAAAAAAAAA
Abandon Ship Station #: AAA

Current Posision: AAAAAAAAAAAAAAA
Previous Position: AAAAAAAAAAAAAAA       Date of Change: mm/dd/yy

1/3 Crew Division System: A
1/2 Crew Division System: A
Session: A

Address: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Near Police st. & phone #: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Religion: AAAAAAAAAAAA     Hobbies: AAAAAAAAAAAAAAAAAAAAAAAAA
Education: AAAAAAAAAAAA    Foreign Languages: AAAAAAAAAAAAAAAAAAAAAAAAA

School: AAAAAAAAAAAAAAA   Date: mm/dd/yy
Degree/Diploma: AAAAAAAAAAAAAAAAAAAA
Comments: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Promotion Date: mm/dd/yy
Command Issued the Order: AAAAAAAAAA
Date of Issued Order: mm/dd/yy

Type of Leave: AAAAAAAAAAAAAAA
Date Starts: mm/dd/yy   Date Ends: mm/dd/yy   No. of Days: AA
Comments-1: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
      Offence #: AAAA       Offence Name: AAAAAAAAAAAAAAAAAAAA
Date of Offence: mm/dd/yy    Punishment:  AAA

Type of Duty: AAAAAAAAAAAAAAAAAAAA       Duty Title: AAAAAAAAAAAAAAA
Duty Instructions: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

Personal Information BOOK / RECORD



```
mm/dd/yy                     Air Control Monthly Report                       Page 9



Last Name: AAAAAAAAAAAAAAA    First Name:AAAAAAAAAAAAAAA
Rank: A      Rate: AAAAAAA    Specialty: AAAAAAAAAAAAAAA
Air Control Category: A       Instructor Air Controler: A

Date. mm/dd/yy   Type of A/C
Time: AAAA        AAAAAAAAAA  Type of Control: A  Duration of Control: AAAA

Comments: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

Air Control Monthly Report Format

```
mm/dd/yy                      Sailors' Monthly Report                          Page 9


  Last Name     Rank Rate   Person ID   Current Pos.           Address
AAAAAAAAAAAAAAA A   AAAAAAA AAAAAAAAAA AAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAA
  First Name                              Specialty        Near Police Station
AAAAAAAAAAAAAAA                          AAAAAAAAAAAAAAA AAAAAAAAAAAAAAAAAAAAAAAA
```

Sailor's Monthly Report Format

```
mm/dd/yy                 Sailors' Punishment Monthly Report                     Page 9


Person ID     Last Name          Rate          Offence # and Name        Date
AAAAAAAAAA AAAAAAAAAAAAAAA      AAAAAAA     AAAA AAAAAAAAAAAAAAAAAAAA  dd/mm/yy
              First Name      Specialty
           AAAAAAAAAAAAAAA AAAAAAAAAAAAAAA          Punishment: AAA
```

Sailor's Punishment Monthly Report Format

APPENDIX H: SYSTEM'S PROGRAM AND CODE

A. PART ONE: DOCUMENTATION OF MENU STRUCTURE

SPAS - Shipboard Personnel Administration System

Menu Tree
Documentation of Menu Structure

MAIN

- PERSONNEL SUBSYSTEM Enter All Personal Data to the System
  - PROCESS CREWMEMBER DATA Enters Crewmember Data to the System
  - PROCESS DEPENDENT DATA Enters Crewmembers' Dependent Data to the System
  - PROCESS DISCIPLINARY DATA Enters Crewmembers' Disciplinary Data to the System
  - PROCESS EVALUATION DATA Enters Crewmembers' Evaluation Data
    - PROCESS OJT EVALUATION DATA Enters Crewmembers' OJT Evaluation Data
    - PROCESS FITNESS EVALUATION DATA Enters Crewmembers' Fitness Data
  - MAINTAIN PERSON DATA Updates all Personnel Data
    - UPDATE AIR CONTROL DATA Keeps Track of Air Control Data
    - UPDATE PROMOTION DATA Updates Personnel Promotion Data
    - UPDATE CREWMEMBER DATA Updates Crewmembers' Personal Data
      - ADD DATA Adds Crewmember Data
      - MODIFY DATA Modifies Crewmember Data
      - DELETE DATA Deletes Crewmember Data
    - UPDATE DEPENDENT DATA Updates Crewmembers' Dependent Data
      - ADD DATA Adds Dependents Data
      - MODIFY DATA Modifies Dependents Data
      - DELETE DATA Deletes Dependents Data

- UPDATE DISCIPLINARY DATA Updates Crewmembers' Disciplinary Data
  - ADD DATA Adds Disciplinary Data
  - MODIFY DATA Modifies Disciplinary Data
  - DELETE DATA Deletes Disciplinary Data
- UPDATE EVALUATION DATA Updates Crewmembers' Evaluation Data
  - ADD DATA Adds Evaluation Data
  - MODIFY DATA Modifies Evaluation Data
  - DELETE DATA Deletes Evaluation Data

REQUEST SUBSYSTEM Handle Personnel Requests

- PROCESS SPECIAL REQUEST Enters the System Crewmembers' Special Requests
- PROCESS LEAVE REQUEST Enters the System Crewmembers' Leave Requests

REPORT SUBSYSTEM Generates All the Reports

- ANSWER SPECIFIED QUERIES Answer Queries
  - QUERY PERSON AND DEPENDENT Query Crewmember and his Dependent Data
  - QUERY PERSON AND SPECIAL STATION Query Crewmember and his Special Station Data
  - QUERY PERSON AND DIVISION SYSTEM Query Crewmember and his Division Data
  - QUERY PERSON,TRAINING,EVALUATION Query Crewmember's Training and Evaluation Data
  - PERSON,REQUEST,LEAVE,OJT,DISCIPL Query Crewmember and his Request,Leave, OJT Evaluation and Disciplinary
- PRODUCE INTERNAL REPORTS Produce Reports for Ship's Use
  - PERSONAL INFORMATION CARD Produce Personal Information Card
  - PERSONAL INFORMATION BOOK Produce Personal Information Book
  - FITNESS EVALUATION REPORT Produce Crewmembers' Fitness Evaluation Report
  - DIVISION SYSTEM REPORT Produce Division Systems Reports
    - 1/3 SYSTEM Produce 1/3 Crew Division System Report
    - 1/2 SYSTEM Produce 1/2 Crew Division System Report
    - SESSION SYSTEM Produce Session Division System Report
  - SPECIAL DUTY STATION REPORT Produce Special Stations Reports
    - ALERT STATION Produce Alert Station Report

- MOOR-ANCHO-TOW STATION Produce Ship's Maneuvers Station Report
    - ABANDON SHIP STATION Produce Abandon Ship Station Report
  - PRODUCE EXTERNAL REPORTS Produce Reports for Higher Commands
    - AIR CONTROLLER MONTHLY REPORT Produce A/C Monthly Report
    - OFFICER SPECIAL REPORT Produce Officers' Special Report
    - OFFICER MONTHLY REPORT Produce Officers' Monthly Report
    - PETTY OFFICER MONTHLY REPORT Produce Petty Officers' Monthly Report
    - SAILOR MONTHLY REPORT Produce Sailors' Monthly Report
    - SAILOR PUNISHMENT MONTHLY REPORT Produce Sailors' Punishment Monthly Report
- EXIT Exit the System
  - EXIT TO PARADOX Exit this Application but stays in PARADOX
  - ———————— <Separator>
  - EXIT TO DOS Exits PARADOX and Goes to DOS

B. PART TWO: DOCUMENTATION OF ACTION MENU

SPAS - Shipboard Personnel Administration System

Edit Session: SN11A

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PERSON

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Enters the System Personal Data

Edit Session: SN11B

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PROMOTIO

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Enters the System Person's Promotion Data

Edit Session: SN11C

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PERSTATN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Assigns Person to Special Stations

Edit Session: SN11D

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PERSDUTY

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Assigns Person to Special Duties

Edit Session: SN12

Mode DataEntry
Passwords: As Needed
Prompt

Tables Declared: 1

Table 1: DEPENDEN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Enters the System Person's Dependent Data

Edit Session: SN124

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: FITNESS

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Enter to the System All Personnel Fitness Evaluation Data

Edit Session: SN13

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DESCIPLN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt:

Edit Session: SN141

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: OJT-EVAL

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Enters the System Personal OJT Evaluation Data

Edit Session: SN151

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: AIR-CTRL

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt: Enters the System Air Control Data

Edit Session: SN152

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PROMOTIO

Initial View: Form

Allowed Views: Form
Use Form: 1
Modes: Ins,Update
On Tablelist:
Prompt: Updates Personnel Promotion Data

Edit Session: SN1531

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PERSON

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Update
On Tablelist:
Prompt: Adds Crewmember Data

Edit Session: SN1532

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PERSON

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Edit
On Tablelist:
Prompt: Modifies Crewmember Data

Edit Session: SN1533

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: PERSON

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Del,Edit
On Tablelist:
Prompt: Deletes Crewmember Data

Edit Session: SN1541

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DEPENDEN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Update
On Tablelist:
Prompt: Adds Dependent Data

Edit Session: SN1542

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DEPENDEN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Edit
On Tablelist:
Prompt: Modifies Dependent Data

Edit Session: SN1543

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DEPENDEN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Del,Edit
On Tablelist:
Prompt: Deletes Dependent Data

Edit Session: SN1551

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DESCIPLN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Update
On Tablelist:
Prompt: Adds Disciplinary Data

Edit Session: SN1552

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DESCIPLN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Edit
On Tablelist:
Prompt: Modifies Disciplinary Data

Edit Session: SN1553

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: DESCIPLN

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Del,Edit
On Tablelist:
Prompt: Deletes Disciplinary Data

Edit Session: SN1561

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: OJT-EVAL

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Update
On Tablelist:
Prompt: Adds OJT Evaluation Data

Edit Session: SN1562

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: OJT-EVAL

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Edit
On Tablelist:
Prompt: Modifies OJT Evaluation Data

Edit Session: SN1563

Mode: Edit
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: OJT-EVAL

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Del,Edit
On Tablelist:
Prompt: Deletes OJT Evaluation Data

Edit Session: SN21

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: REQUEST

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt:

Edit Session: SN22

Mode: DataEntry
Passwords: As Needed
Prompt:

Tables Declared: 1

Table 1: LEAVE

Initial View: Form
Allowed Views: Form
Use Form: 1
Modes: Ins,Edit
On Tablelist:
Prompt:

Edit Session: SN311

Mode: DataEntry
Passwords: As Needed
Prompt: Enter the Crewmember Last/First Name

Tables Declared: 1

Table 1: AD-HOC

Initial View: Form
Allowed Views: Form
Use Form: F
Modes: Ins,Edit
On Tablelist:
Prompt:

Edit Session: SN312

Mode: DataEntry

Passwords: As Needed
Prompt: Enter the Crewmember Last/First Name

Tables Declared: 1

Table 1: AD-HOC

Initial View: Form
Allowed Views: Form
Use Form: F
Modes: Ins,Edit
On Tablelist:
Prompt:

Edit Session: SN313

Mode: DataEntry
Passwords: As Needed
Prompt: Enter the Crewmember Last/First Name

Tables Declared: 1

Table 1: AD-HOC

Initial View: Form
Allowed Views: Form
Use Form: F
Modes: Ins,Edit
On Tablelist:
Prompt:

Edit Session: SN314

Mode: DataEntry
Passwords: As Needed
Prompt: Enter the Crewmember Last/First Name

Tables Declared: 1

Table 1: AD-HOC

Initial View: Form
Allowed Views: Form
Use Form: F
Modes: Ins,Edit

On Tablelist:
Prompt:

Edit Session: SN315

Mode: DataEntry
Passwords: As Needed
Prompt: Enter the Crewmember Last/First Name

Tables Declared: 1

Table 1: AD-HOC

Initial View: Form
Allowed Views: Form
Use Form: F
Modes: Ins,Edit
On Tablelist:
Prompt:

Multiple Actions: MA11

Actions Called:

1) Edit Session: SN11A
2) Edit Session: SN11B
3) Edit Session: SN11C
4) Edit Session: SN11D

[X] Quit if Action fails

Multiple Actions: MA311

Actions Called:

1) Edit Session: SN311
2) Play a Script: Adhoc1
3) Report Print: PRN311
4) Play a Script: Empty

[X] Quit if Action fails

Multiple Actions: MA312

Actions Called:

1) Edit Session: SN312
2) Play a Script: Adhoc2
3) Report Print: PRN312
4) Play a Script: Empty

[X] Quit if Action fails

Multiple Actions: MA313

Actions Called:

1) Edit Session: SN313
2) Play a Script: Adhoc3
3) Report Print: PRN313
4) Play a Script: Empty

[X] Quit if Action fails

Multiple Actions: MA314

Actions Called:

1) Edit Session: SN314
2) Play a Script: Adhoc4
3) Report Print: PRN314
4) Play a Script: Empty

[X] Quit if Action fails

Multiple Actions: MA315

Actions Called:

1) Edit Session: SN315
2) Play a Script: Adhoc5
3) Report Print: PRN315
4) Play a Script: Empty

[X] Quit if Action fails

Multiple Actions: MA316

Actions Called:

1) Play a Script:	Q321
2) Report Print:	PRN321

[X] Quit if Action fails

Multiple Actions: MA322

Actions Called:

1) Play a Script:	Q322
2) Report Print:	PRN322

[X] Quit if Action fails

Multiple Actions: MA323

Actions Called:

1) Play a Script:	Q323
2) Report Print:	PRN323

[X] Quit if Action fails

Multiple Actions: MA324A

Actions Called:

1) Play a Script:	Q324a
2) Report Print:	PRN324A

[X] Quit if Action fails

Multiple Actions: MA324B

Actions Called:

1) Play a Script: Q324b
2) Report Print: PRN324B

[X] Quit if Action fails

Multiple Actions: MA324C

Actions Called:

1) Play a Script: Q324c
2) Report Print: PRN324C

[X] Quit if Action fails

Multiple Actions: MA325A

Actions Called:

1) Play a Script: Q325a
2) Report Print: PRN325A

[X] Quit if Action fails

Multiple Actions: MA325B

Actions Called:

1) Play a Script: Q325b
2) Report Print: PRN325B

[X] Quit if Action fails

Multiple Actions: MA325C

Actions Called:
1) Play a Script: Q325c
2) Report Print: PRN325C

[X] Quit if Action fails

Multiple Actions: MA331

Actions Called:

1) Play a Script: Q331
2) Report Print: PRN331

[X] Quit if Action fails

Multiple Actions: MA332

Actions Called:

1) Play a Script: Q332
2) Report Print: PRN332

[X] Quit if Action fails

Multiple Actions: MA333

Actions Called:

1) Play a Script: Q333
2) Report Print: PRN333

[X] Quit if Action fails

Multiple Actions: MA334

Actions Called:

1) Play a Script: Q334
2) Report Print: PRN334

[X] Quit if Action fails

Multiple Actions: MA335

Actions Called:

1) Play a Script: Q335
2) Report Print: PRN335

[X] Quit if Action fails

Multiple Actions: MA336

Actions Called:

1) Play a Script: Q336
2) Report Print: PRN336

[X] Quit if Action fails

Report Print: PRN311

Table: ANSWER
Report #: R

Use Data From: Listed Table
Output Devices: Screen
Display Working Message: Yes
Working Message: Here is the Requested Data
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN312

Table ANSWER
Report #. R

Use Data From: Listed Table
Output Devices: Screen
Display Working Message: Yes
Working Message: Here is the Requested Data
Printer Port: Default
Page Break: Default

Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN313

Table: ANSWER
Report #: R

Use Data From: Listed Table
Output Devices: Screen
Display Working Message: Yes
Working Message: Here is the Requested Data
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN314

Table: ANSWER
Report #: R

Use Data From: Listed Table
Output Devices: Screen
Display Working Message: Yes
Working Message: Here is the Requested Data
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN315

Table: ANSWER
Report #: R

Use Data From: Listed Table
Output Devices: Screen
Display Working Message: Yes
Working Message: Here is the Requested Data
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN321

Table: T321
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Personal Information Card ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN322

Table: T322
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Personal Info Book/Record ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN323

Table: T323
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Personnel Fitness Evaluation Report..
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN324A

Table: T324A
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: 1/3 Crew Division System Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN324B

Table: T324B
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: 1/2 Crew Division System Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None

Cleanup Proc: None

Report Print: PRN324C

Table: T324C
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Session Division Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN325A

Table: T325A
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Alert Station Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN325B

Table: T325B
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes

Working Message: Special Station Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN325C

Table: T325C
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Abandon Ship Station Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN331

Table: T331
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Air Control Monthly Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN332

Table: T332
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Officer Special Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN333

Table: T333
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Officers' Monthly Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN334

Table: T334
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Petty Officers' Monthly Report ...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN335

Table: T335
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Sailors' Monthly Report...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

Report Print: PRN336

Table: T336
Report #: 1

Use Data From: Listed Table
Output Devices: Screen, Printer
Display Working Message: Yes
Working Message: Sailors' Punishment Monthly Report...
Printer Port: Default
Page Break: Default
Prefix String: None
Suffix String: None
Setup Proc: None
Cleanup Proc: None

C. PART THREE: DOCUMENTATION OF CROSS-REFERENCE MENU

SPAS - Shipboard Personnel Administration System

Cross Reference
Action Objects & Paradox Objects in Use

Objects in the Menu & Object Tables:		Referenced by:	
Object Type	Object Name	Object Type	Object Name
Edit Session	SN11A	Multiple Actions	MA11
Edit Session	SN11B	Multiple Actions	MA11
Edit Session	SN11C	Multiple Actions	MA11
Edit Session	SN11D	Multiple Actions	MA11
Edit Session	SN12	Menu	CFG\SPAS
Edit Session	SN124	Menu	CFG\SPAS
Edit Session	SN13	Menu	CFG\SPAS
Edit Session	SN141	Menu	CFG\SPAS
Edit Session	SN151	Menu	CFG\SPAS
Edit Session	SN152	Menu	CFG\SPAS
Edit Session	SN1531	Menu	CFG\SPAS
Edit Session	SN1532	Menu	CFG\SPAS
Edit Session	SN153	Menu	CFG\SPAS
Edit Session	SN1541	Menu	CFG\SPAS
Edit Session	SN1542	Menu	CFG\SPAS
Edit Session	SN1543	Menu	CFG\SPAS
Edit Session	SN1551	Menu	CFG\SPAS
Edit Session	SN1552	Menu	CFG\SPAS
Edit Session	SN1553	Menu	CFG\SPAS
Edit Session	SN1561	Menu	CFG\SPAS
Edit Session	SN1562	Menu	CFG\SPAS
Edit Session	SN1563	Menu	CFG\SPAS
Edit Session	SN21	Menu	CFG\SPAS
Edit Session	SN22	Menu	CFG\SPAS
Edit Session	SN311	Multiple Actions	MA311
Edit Session	SN312	Multiple Actions	MA312
Edit Session	SN313	Multiple Actions	MA313
Edit Session	SN314	Multiple Actions	MA314
Edit Session	SN315	Multiple Actions	MA315
Exit Paradox		Menu	CFG\SPAS
Form	AD-HOC.F	Edit Session	SN311
		Edit Session	SN312
		Edit Session	SN313
		Edit Session	SN314
		Edit Session	SN315

Form	AIR-CTRL.F1	Edit Session	SN151
Form	DEPENDEN.F1	Edit Session	SN12
		Edit Session	SN1541
		Edit Session	SN1542
		Edit Session	SN1543
Form	DESCIPLN.F1	Edit Session	SN13
		Edit Session	SN1551
		Edit Session	SN1552
		Edit Session	SN1553
Form	FITNESS.F1	Edit Session	SN124
Form	LEAVE.F1	Edit Session	SN22
Form	OJT-EVAL.F1	Edit Session	SN141
		Edit Session	SN1561
		Edit Session	SN1562
		Edit Session	SN1563
Form	PERSDUTY.F1	Edit Session	SN11D
Form	PERSON.F1	Edit Session	SN11A
		Edit Session	SN1531
		Edit Session	SN1532
		Edit Session	SN1533
Form	PERSTATN.F1	Edit Session	SN11C
Form	PROMOTIO.F1	Edit Session	SN11B
		Edit Session	SN152
Form	REQUEST.F1	Edit Session	SN21
Multiple Actions	MA11	Menu	CFG\SPAS
Multiple Actions	MA311	Menu	CFG\SPAS
Multiple Actions	MA312	Menu	CFG\SPAS
Multiple Actions	MA313	Menu	CFG\SPAS
Multiple Actions	MA314	Menu	CFG\SPAS
Multiple Actions	MA315	Menu	CFG\SPAS
Multiple Actions	MA321	Menu	CFG\SPAS
Multiple Actions	MA322	Menu	CFG\SPAS
Multiple Actions	MA323	Menu	CFG\SPAS
Multiple Actions	MA324A	Menu	CFG\SPAS
Multiple Actions	MA324B	Menu	CFG\SPAS
Multiple Actions	MA324C	Menu	CFG\SPAS
Multiple Actions	MA325A	Menu	CFG\SPAS
Multiple Actions	MA325B	Menu	CFG\SPAS
Multiple Actions	MA325C	Menu	CFG\SPAS
Multiple Actions	MA331	Menu	CFG\SPAS
Multiple Actions	MA332	Menu	CFG\SPAS
Multiple Actions	MA333	Menu	CFG\SPAS
Multiple Actions	MA334	Menu	CFG\SPAS
Multiple Actions	MA335	Menu	CFG\SPAS
Multiple Actions	MA336	Menu	CFG\SPAS
Play a Script	ADHOC1	Multiple Actions	MA311
Play a Script	ADHOC2	Multiple Actions	MA312

Play a Script ADHOC3	Multiple Actions MA313
Play a Script ADHOC4	Multiple Actions MA314
Play a Script ADHOC5	Multiple Actions MA315
Play a Script EMPTY	Multiple Actions MA311
	Multiple Actions MA312
	Multiple Actions MA313
	Multiple Actions MA314
	Multiple Actions MA315
Play a Script Q321	Multiple Actions MA321
Play a Script Q322	Multiple Actions MA322
Play a Script Q323	Multiple Actions MA323
Play a Script Q324A	Multiple Actions MA324A
Play a Script Q324B	Multiple Actions MA324B
Play a Script Q324C	Multiple Actions MA324C
Play a Script Q325A	Multiple Actions MA325A
Play a Script Q325B	Multiple Actions MA325B
Play a Script Q325C	Multiple Actions MA325C
Play a Script Q331	Multiple Actions MA331
Play a Script Q332	Multiple Actions MA332
Play a Script Q333	Multiple Actions MA333
Play a Script Q334	Multiple Actions MA334
Play a Script Q335	Multiple Actions MA335
Play a Script Q336	Multiple Actions MA336
Procedure	Application SPAS
Quit to Paradox	Menu CFG\SPAS
Report ANSWER.R	Report Print PRN311
	Report Print PRN312
	Report Print PRN313
	Report Print PRN314
	Report Print PRN315
Report T321.R1	Report Print PRN321
Report T322.R1	Report Print PRN322
Report T323.R1	Report Print PRN323
Report T324A.R1	Report Print PRN324A
Report T324B.R1	Report Print PRN324B
Report T324C.R1	Report Print PRN324C
Report T325A.R1	Report Print PRN325A
Report T325B.R1	Report Print PRN325B
Report T325C.R1	Report Print PRN325C
Report T331.R1	Report Print PRN331
Report T332.R1	Report Print PRN332
Report T333.R1	Report Print PRN333
Report T334.R1	Report Print PRN334
Report T335.R1	Report Print PRN335
Report T336.R1	Report Print PRN336
Report Print PRN311	Multiple Actions MA311
Report Print PRN312	Multiple Actions MA312

Report Print	PRN313	Multiple Actions	MA313
Report Print	PRN314	Multiple Actions	MA314
Report Print	PRN315	Multiple Actions	MA315
Report Print	PRN321	Multiple Actions	MA321
Report Print	PRN322	Multiple Actions	MA322
Report Print	PRN323	Multiple Actions	MA323
Report Print	PRN324A	Multiple Actions	MA324A
Report Print	PRN324B	Multiple Actions	MA324B
Report Print	PRN324C	Multiple Actions	MA324C
Report Print	PRN325A	Multiple Actions	MA325A
Report Print	PRN325B	Multiple Actions	MA325B
Report Print	PRN325C	Multiple Actions	MA325C
Report Print	PRN331	Multiple Actions	MA331
Report Print	PRN332	Multiple Actions	MA332
Report Print	PRN333	Multiple Actions	MA333
Report Print	PRN334	Multiple Actions	MA334
Report Print	PRN335	Multiple Actions	MA335
Report Print	PRN336	Multiple Actions	MA336
Table	AD-HOC	Edit Session	SN311
		Edit Session	SN312
		Edit Session	SN313
		Edit Session	SN314
		Edit Session	SN315
Table	AIR-CTRL	Edit Session	SN151
Table	ANSWER	Report Print	PRN311
		Report Print	PRN312
		Report Print	PRN313
		Report Print	PRN314
		Report Print	PRN315
Table	DEPENDEN	Edit Session	SN12
		Edit Session	SN1541
		Edit Session	SN1542
		Edit Session	SN1543
Table	DESCIPLN	Edit Session	SN13
		Edit Session	SN1551
		Edit Session	SN1552
		Edit Session	SN1553
Table	FITNESS	Edit Session	SN124
Table	LEAVE	Edit Session	SN22
Table	OJT-EVAL	Edit Session	SN141
		Edit Session	SN1561
		Edit Session	SN1562
		Edit Session	SN1563
Table	PERSDUTY	Edit Session	SN11D
Table	PERSON	Edit Session	SN11A
		Edit Session	SN1531
		Edit Session	SN1532

		Edit Session	SN1533
Table	PERSTATN	Edit Session	SN11C
Table	PROMOTIO	Edit Session	SN11B
		Edit Session	SN152
Table	REQUEST	Edit Session	SN21
Table	T321	Report Print	PRN321
Table	T322	Report Print	PRN322
Table	T323	Report Print	PRN323
Table	T324A	Report Print	PRN324A
Table	T324B	Report Print	PRN324B
Table	T324C	Report Print	PRN324C
Table	T325A	Report Print	PRN325A
Table	T325B	Report Print	PRN325B
Table	T325C	Report Print	PRN325C
Table	T331	Report Print	PRN331
Table	T332	Report Print	PRN332
Table	T333	Report Print	PRN333
Table	T334	Report Print	PRN334
Table	T335	Report Print	PRN335
Table	T336	Report Print	PRN336

APPENDIX I: PROCEDURES FOR INSTALLING AND OPERATING SPAS

A. Installation Procedure

To run any Paradox application, Paradox itself must be installed. To install Paradox the user has to run the Paradox installation program. Instructions for installing Paradox can be found in Paradox manuals.

B. Setting up the SPAS application

After installing Paradox you need to setup the SPAS application. This can be done in several ways. The suggested method from the DOS environment is described on the following page. Your SPAS application disk includes all required files and has one directory and two subdirectories. Figure 16 shows how the files are organized in the diskette.

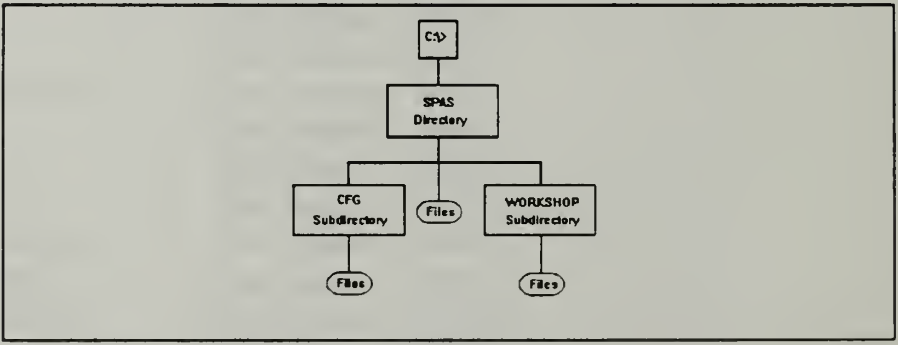
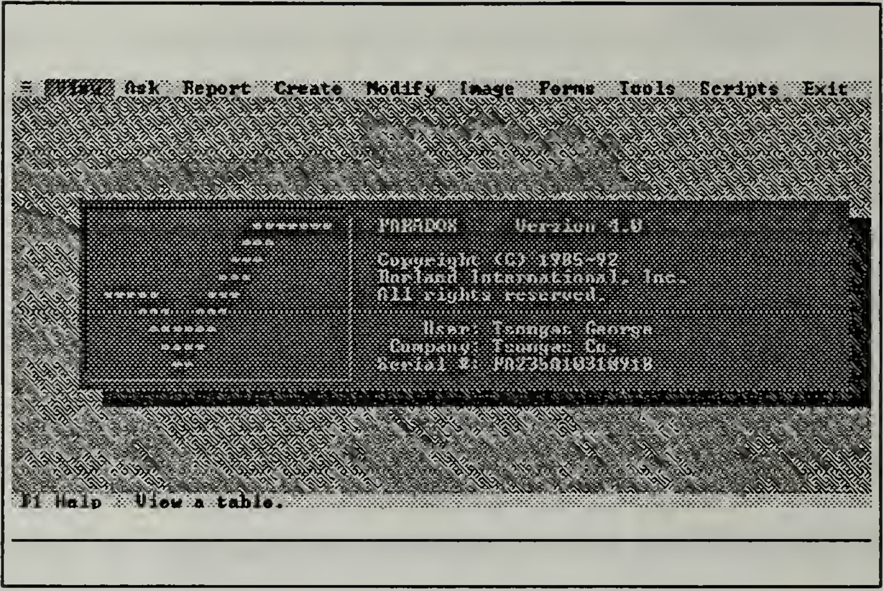


Figure 16:SPAS application disk hierarchy

From the DOS environment, insert the application disk into the floppy drive, and perform the following steps:

1. Make sure that you are at the **C:\PDOX40>**. (If you are at the **C:\>**, type **cd PDOX40** and then hit enter).
2. Type **md SPAS** (creates the SPAS directory)
3. Type **cd SPAS** (puts you in SPAS directory and displays the C:\PDOX40\SPAS> prompt)
4. Type **md CFG** (creates the CFG directory)
5. Type **md WORKSHOP** (creates the WORKSHOP directory)
6. Type **copy a:\spas\*.* c:** (copies the files to hard disk)
7. Type **cd CFG** (puts you in the CFG directory and displays the C:\PDOX40\SPAS\CFG> prompt)
8. Type **copy a:\spas\cfg\*.* c:** (copies the files to hard disk)
9. Type **cd..** (you are at the C:\PDOX40\SPAS> prompt)
10. Type **cd WORKSHOP** (puts you in the WORKSHOP directory and displays the C:\PDOX40\SPAS\WORKSHOP> prompt)
11. Type **copy a:\spas\workshop\*.* c:** (copies the files to hard disk)

Now you have everything copied on your hard disk drive, and your application is ready to run. You can start running Paradox by typing "paradox" at the C:\PDOX40\SPAS> prompt. Figure 17 shows how your screen will look like.


≡ View Ask Report Create Modify Image Forms Tools Scripts Exit
F1 Help View a table.

PARADOX Version 4.0

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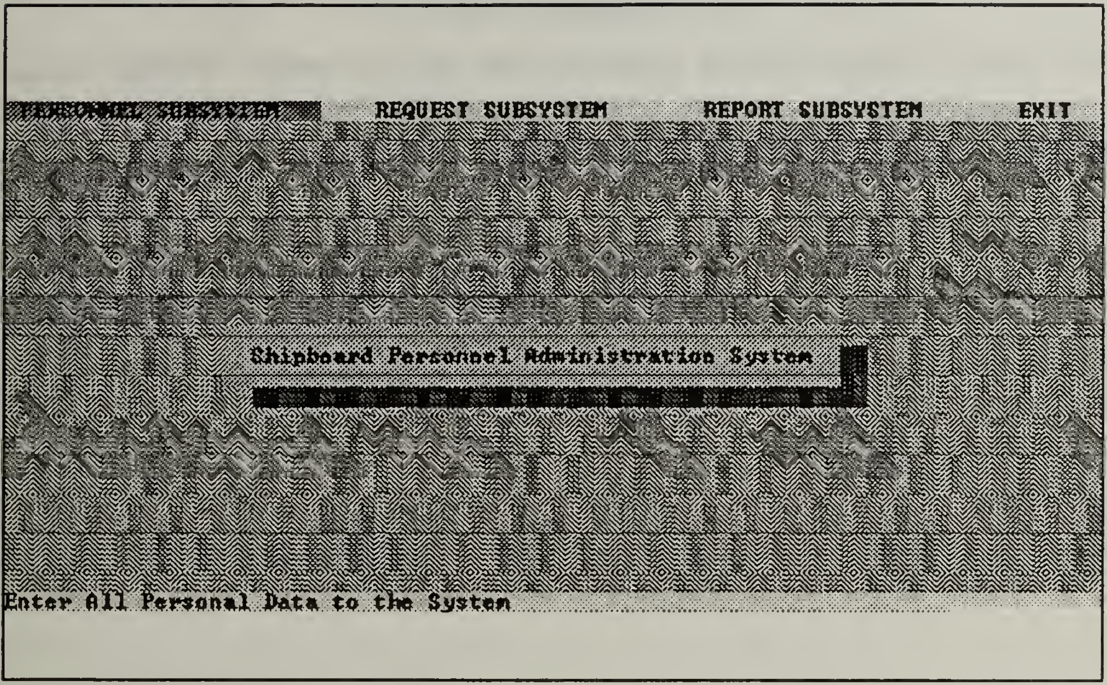
Figure 17: Paradox screen

C. Using the SPAS application

To run the SPAS application in the Paradox environment, you have to select the application from the pull-down menu bar. Using the mouse, click *on the top left most field* of the pull-down menu bar (indicated by three horizontal lines), then click on *"Utilities"*, and then click on *"Workshop"*. The working desktop now is the Paradox workshop. On the new desktop, click on *"Application"*, then on *"Directory"*, type **c:\pdox40\spas** and hit enter,or click on *OK*. Now you are at the application workspace. Click again on *"ParadoxEdit"*, *"Scripts"* and select *"SPAS"* from the scripts list. Finally click on *"Play"* and the SPAS application will be executed showing a screen that looks like figure 18.


PERSONNEL SUBSYSTEM
REQUEST SUBSYSTEM
REPORT SUBSYSTEM
EXIT
Shipboard Personnel Administration System

Enter All Personal Data to the System

Figure 18: SPAS screen

1. Main menus

The application has four main pull-down menus. Figure 18 shows the main menus named **"PERSONNEL SUBSYSTEM"**, **"REQUEST SUBSYSTEM"**, **"REPORT SUBSYSTEM"**, and **"EXIT"**. Each menu has submenus which in turn may have submenus. The function of each menu is self descriptive. For more details refer to Appendix E.

2. Help screens

Help screens are included in SPAS and are designed to help the user follow the right steps for each procedure. In this way the user can respond correctly to data entry and updates and eliminate potential mistakes.

3. Printing outputs

After performing a report operation from the report subsystem, there is a dialog box asking whether to print the results onto the screen, or to the printer. Choose the desired output media from this menu.

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